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## Article

# Looking for friends and followers: a global investigation of governmental social media use

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# Looking for friends and followers: a global investigation of governmental social media use

Looking for  
friends and  
followers

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## Abstract

**Purpose** – The purpose of this paper is to identify governmental social media use in cities with enhanced information and communications technology infrastructures (i.e. Informational World Cities) and high Internet penetration rates. Social media platforms are increasingly being used by governments to foster user interaction and it was investigated if social media platforms are valuable tools for reaching high numbers of citizens.

**Design/methodology/approach** – This paper is based on an iterative content and Web analysis from November 2012 till January 2013 and offers a comparison of different social media service types and the particular use.

**Findings** – This empirical investigation of 31 Informational World Cities provides an overview of social media services used for governmental purposes, of their popularity among governments and of their usage intensity in broadcasting information online. Even as cities in a globalized world become more similar, a variety in the use of social media by governments was detected, which is due to regional and cultural characteristics.

**Research limitations/implications** – The findings are limited to calculable data, e.g. number of used social media accounts, posts and followers which were available through a content and Web analysis at the time of investigation.

**Practical implications** – A more detailed content analysis, as well as a more differentiated analysis of users, must be conducted in the future.

**Originality/value** – This paper is one of the first that presents a global comparison of governmental social media use of cities of the knowledge society and compares different social media platforms.

**Keywords** Social media, Knowledge society, Global analysis, Informational cities

**Paper type** Research paper

## Introduction

In 2013, YouTube and Facebook reached over one billion active users ([The Associated Press, 2013](#); [YouTube, 2013](#)). Therefore, we may conclude that enhanced information

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and communications technology (ICT) infrastructures and the increasing use of technology have reshaped communication. Social media platforms have become popular in citizens' everyday lives, and municipalities, too, will use these channels to get in touch with citizens online. ICT infrastructure and high Internet penetration are important preconditions for guaranteeing that a large amount of citizens can make use of those communication channels and of the Internet in general. Both factors can be found in "Informational World Cities" (Stock, 2011) or "Smart Cities" (Shapiro, 2006), representing prototypical cities of the knowledge society (such as Singapore, New York or Hong Kong).

Moreover, on a country level, Sáez-Martin *et al.* (2014) found a direct relation between the "smartness" of a city and the social media adoption of its government. In Spain, "the 'smartest' smart cities are those which obtain the best overall results in terms of social networks" (Sáez-Martin *et al.*, 2014, p. 521). In studies on the use of social media channels of governmental agencies, it also has been stated that "social media in government is becoming one of the major trends in Electronic Government (e-government) research and practice worldwide" (Criado *et al.*, 2013, p. 319). However, there is no study on governmental social media activity which has focused on a global comparison between cities and different social media services.

We aim at studying e-governments in prototypical cities of the knowledge society all over the world. It is our hypothesis that in such world cities (or at least in some of them), e-government is well advanced. To acknowledge this, we study basic information about the world cities' governments' application of social media. We are going to study governmental accounts on social media platforms, the connections between official government Web sites and their social media presences, the activity of governmental bodies on those platforms and the effects of governmental activities in terms of follower as well as "like" numbers. Based on the findings, we formulate recommendations for governments regarding their social media activities, e.g. "How many platforms should we deploy?" "How should we interconnect our Web sites with our social media channels (as well as the social media channels among each other)?" "How often should we add posts on certain media?" and "Do we really reach our stakeholders via social media?" Additionally, our empirical analysis will lay the foundation for further studies on governments' social media use concerning the style of posted content as well as the effectiveness of running social media accounts by governments.

The remainder of the paper is structured as follows: after the literature review, we will describe basic concepts and formulate research questions. We then briefly sketch how data collection was carried out, what restrictions we had to face and which methods we used in the study. In the results sections, one will find information on the Informational World Cities' governmental accounts on social media platforms, on interconnections between governmental Web sites and social media channels, on the amount of the governments' social media activities and on the numbers of followers and "likes". The paper ends with a discussion of our main results and gives an outlook on future work.

### Literature review

In the literature, a distinction is made between the terms "e-governance", "e-government" and "Government 2.0." e-governance is used as a generic term for planning, innovation and funding at the city level (Sharma and Palvia, 2010). According

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to Yigitcanlar (2010), e-governance is the fundamental basis for innovation in an Informational World City. It enables important properties of a city, such as the improvement of living standards and the increase of economic growth through better cooperation between authorities and citizens as well as businesses. The increasing usage of ICT allows businesses and citizens to engage in political debates and decision-making processes online (Sharma and Palvia, 2010; Gisler, 2001; Sriramesh and Rivera-Sánchez, 2006). Five interaction levels are specified by Moon (2002) to describe the transformation of government to e-government: information, communication, transaction, integration and participation. The second stage, “communication”, has been evolving from face-to-face conversation in the office and “snail mail” correspondence to real-time conversations on social media platforms such as Facebook or Twitter (Mainka *et al.*, 2013; Hartmann *et al.*, 2013; Mainka *et al.*, 2014). The fifth stage, “participation”, describes an ideological notion. At this stage, citizens are provided with, and, in fact, seize, the opportunity of engaging in political decision-making processes (Bertot *et al.*, 2012; Charalabidis and Loukis, 2012; Dahlgren, 2012; Effing *et al.*, 2011; Ellison and Hardey, 2013; Karantzeni, and Gouscos, 2013).

The increasing governmental usage of the Web is referred to as Government 2.0 (Bonsón *et al.*, 2012; Eggers, 2005). However, the term “Government 2.0” is not to be equated with “Web 2.0” (O’Reilly, 2005), which was coined to acknowledge the emergence of social media. Instead, Government 2.0 is used in conjunction with “a more open, social, communicative, interactive and user-centered version of e-government” (Meijer *et al.*, 2012). There is a demand that online interaction with citizens on governmental homepages or on social media platforms should be citizen-centered (Eggers, 2005). Also, citizens should be seen as customers whose demands need to be satisfied and whose experience should be leveraged for proposals to political actions as well. Social media form new communication channels and as such can connect citizens and local governments (Mossberger *et al.*, 2013). Linders (2012) calls this change “from e-government to we-government”, leading to innovative governmental behavior (Criado *et al.*, 2013) by linking the appropriate technology, the task and the organizational context (Maultasch Oliveira and Welch, 2013). By making technology an integral part of Government 2.0, theoretical benefits emerge which include cost reductions, enhanced participation, transparency and enhanced trust (Warkentin *et al.*, 2002; Bertot *et al.*, 2010).

The importance of Government 2.0 has been confirmed by several studies. Most analyses of governmental social media usage are generally performed in a more in-depth fashion, e.g. investigating communication on specific platforms and concerning specific topics (Skirbunt *et al.*, 2009; Zhang and Chan, 2013). Münchener Kreis (2013) evaluated the needs of citizens in interacting with governments and administrations. This study was conducted in 2012 and 2013 and represents Internet users between the ages of 18 and 70 years and living in Germany, the USA, Brazil, China, India and South Korea. Their results show that more than 40 per cent of users in Brazil, China and India would like to use electronic services for citizens via social media platforms. Furthermore, citizens are interested in being involved in political decision-making processes such as policy debates. However, users in all these nations have less confidence in these platforms when it comes to the protection of their personal data. This study shows that there is an audience on the World Wide Web who would like to use social media to get in touch with governments and administrations. Accordingly, it is advisable for

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governments to be represented on social media platforms if they want to reach as many of their citizens as possible.

The free market was an early adopter of social media platforms as marketing tools (Mangold and Faulds, 2009). Governments followed this motion. Norris and Reddick (2012) found (for the year 2011) that 67.5 per cent of all local governments in the USA utilize social media. Nearly all communities bank on Facebook, but Twitter, YouTube, blogs and Flickr are applied as well. Also for 2011, Mossberger *et al.* (2013) reported that 87 per cent of the major US cities adopted Facebook and also 87 per cent applied Twitter. In the UK, Facebook and Twitter are heavily used by local governments as well (Ellison and Hardey, 2014).

But social media platforms do not run themselves, and being present on them does not necessarily entail eParticipation (Coursey and Norris, 2008). Hence, a strategy is needed. But there are two main challenges:

- (1) every social media account must be continuously updated; and
- (2) every government must find the most profitable way of reaching its citizens (United Nations, 2010).

Proving the efficiency of communication, engagement and eParticipation via social media platforms is, however, problematic, although for Mergel (2013), there is a certain lack of measurement practices for social media interactions. “Many government agencies are experimenting with the use of social media, however very few actively measure the impact of their digital interaction” (Mergel, 2013, p. 327). Our study aims at finding ways to measure use and impact of e-governments.

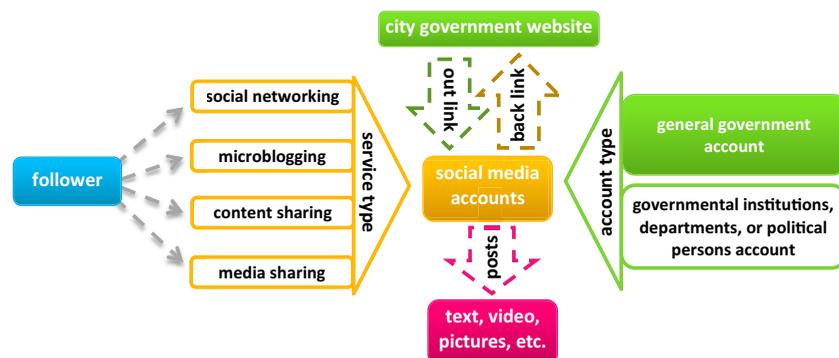
Thus, when analyzing e-government in Informational World Cities with regard to the indicators “communication” and “participation”, it must first be proven whether and which communication platforms (e.g. social media) are used by governments, whether government accounts are visible on the web, whether they are used frequently and whether they reach a large audience. Hence, in this paper, we will investigate the following research questions:

- RQ1.* How many platforms should governments deploy?
- RQ2.* How should governments interconnect their Web sites with their social media channels (as well as the social media channels among each other)?
- RQ3.* How often should governments add posts on certain media?
- RQ4.* Do governments really reach their stakeholders via social media?

## Method

We analyze the governmental social media activity of 31 “Informational World Cities”. In this investigation, we differentiate between general government accounts, which represent the whole city, and accounts of governmental institutions, departments or political persons (Figure 1). The authors have been assisted by a Chinese native speaker and used the online translation from Google, if a Web site was not available in English or German. The data were collected between November 28, 2012 and January 3, 2013, so results are based on the data which were available online at that time.

The data collection was restricted to the online available data and platform-specific functionalities. For instance, we could not count the number of followers of a blog



**Figure 1.**  
Social media analysis  
of governmental  
accounts

because blogs do not offer this function. Also, the number of posts is not available for all platforms by just visiting the governments' profiles. For example, the number of posts is shown on Twitter but not on Facebook.

The detection of governmental social media accounts was carried out in two steps:

- (1) content analysis of governmental Web sites (*out links*); and
- (2) content analysis of social media services (*back links*) (Krippendorff, 2004; Neuendorf, 2002).

In the first step, we found a lot of social media services which were used in the second step to retrieve governmental accounts which have no link from their city government Web site. This method has helped us detect rather new or special regional services like Weibo in China. All data which are available online were collected manually (e.g. number of followers or of shared content). Thus, the counting process was equal for all services even if they offer an application program interface (API) or not. The results are presented in total, percentage or mean numbers to highlight the different cases.

## Results

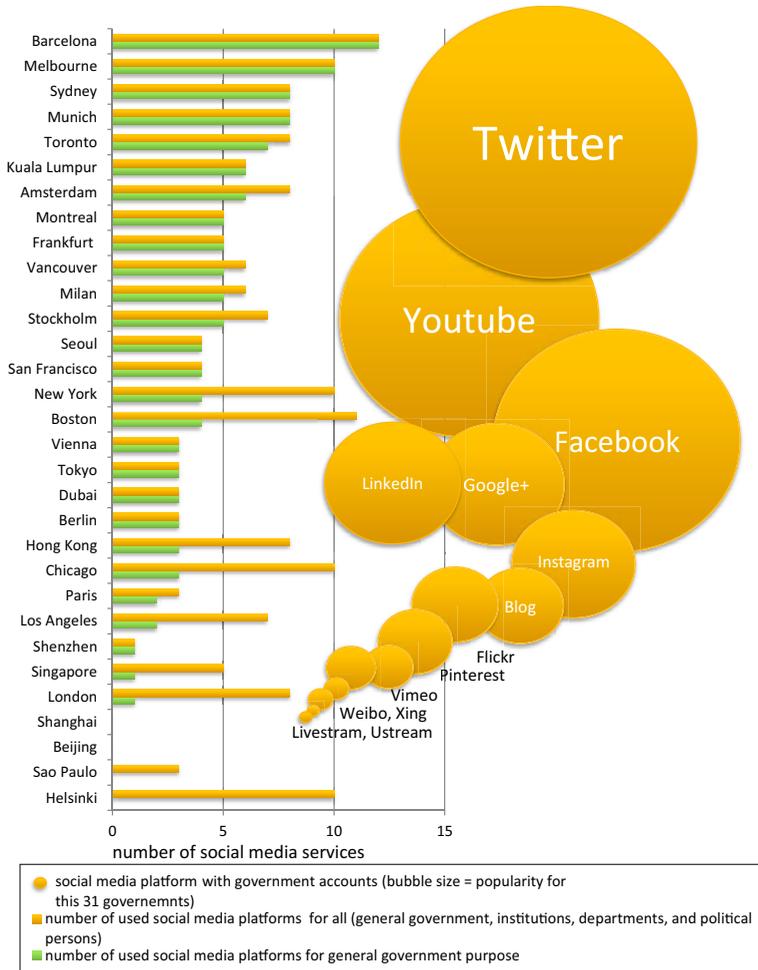
In this section, we present the results of our analysis as guided by the aforementioned research questions.

### *Governmental accounts on social media platforms*

A variety of social media services is used by governmental agencies in the 31 cities: they use social networking platforms like Facebook, Google+ and Hyves (a Dutch service), as well as the business social networks LinkedIn and Xing (a German service); the microblogging services Twitter and Sina Weibo; content-sharing services like Blogs, Tumblr (which is used by New York to serve the same purpose as a blog), Pinterest and Storify; and in terms of media sharing the video platforms, YouTube, Vimeo, Livestream and Ustream are used, as well as the photo-sharing applications Flickr and Instagram. In sum, we detected 15 different social media platforms used to represent general government accounts. The total numbers of general government accounts for each social media service found on the Web sites are: 24 on Twitter, 21 on YouTube, 20 on Facebook, 11 accounts on Google+ and LinkedIn, 10 on Instagram, 7 on blogs and on Flickr, 6 on Pinterest, 4 on Vimeo, 2 on Weibo and Xing and, finally, 1 each on

Livestream, Ustream and Tumblr. Inactive accounts (e.g. registered accounts without any posts, photos, videos etc.) were included in our analysis. Storify and Hyves have not been considered because none of them was used by governments for general purposes. New York's blog on Tumblr is counted among blogs, as it serves the same purposes. However, social media services do not only vary strongly in the number of governments by which they are used but in regional usage as well. For example, Weibo is only used in Chinese regions, and social networking services like Facebook are less common in China than in Europe.

Figure 2 illustrates which social media platforms are used by governments. The services are ranked by the number of cities that use them. The most frequently used service is Twitter. All in all, 24 cities use this microblogging service for general government accounts. The Chinese microblogging service Weibo is used by only two cities (Hong Kong and Shenzhen), which is due to the language barrier and political



**Figure 2.** Social media platforms used for governmental purposes in Informational World Cities

restrictions in China often keeping non-Chinese cities from using the service. Where applicable, the results of Twitter and Weibo will be cumulated due to the great resemblance between these two microblogging services. The second and third most common platforms for government accounts are YouTube and Facebook. After these, there is a fall-off in the number of cities that use a specific platform for general government accounts, e.g. Google+, LinkedIn, Instagram, blogs (including Tumblr), Flickr, Pinterest, etc. In sum, we detected 14 (or 15, including New York's Tumblr) different social media platforms used to represent general government accounts. Figure 2 also illustrates the number of social media platforms used for each city. The cities with the most diverse usage of social media services are Barcelona with 12, Melbourne with 10, Sydney and Munich with 8 and Toronto with 7 general government accounts across different platforms. On average, cities use approximately four social media platforms to communicate with their stakeholders. There are also cities that have no general government account but often use social media services to distribute information about administrations, institutions and political persons. For instance, Helsinki has no general government account but uses a very detailed social media page ([www.hel.fi/www/helsinki/fi/kaupunki-ja-hallinto/osallistu-ja-vaikuta/some](http://www.hel.fi/www/helsinki/fi/kaupunki-ja-hallinto/osallistu-ja-vaikuta/some)) to link to 57 different Facebook accounts, all related to Helsinki. They also refer to many accounts on Twitter and YouTube.

#### *Interconnectedness between governments' social media accounts and web presences*

To reach an audience online, the governments' activity on social media platforms has to be made visible to citizens and to other users. Therefore, we checked whether these accounts are linked to each city's official government Web site. Because the World Wide Web has been considered to be a network of links (Berners-Lee *et al.*, 1992), links from an official government Web site may enhance the visibility and popularity of the government accounts and the government Web sites, respectively. In addition, such outlinks emphasize the seriousness of government accounts on social media platforms and enhance their credibility. As shown in Table I, most of the general government accounts link back to their official Web sites. Only the accounts on Instagram, Vimeo

Social media platform	Outlinks from city's government web site: no. of cities	Backlinks to city's government web site: no. of cities
Twitter	24	23
YouTube	21	21
Facebook	20	18
LinkedIn	11	10
Google+	11	10
Instagram	10	5
Flickr	7	5
Pinterest	6	6
Vimeo	3	0
Xing	2	2
Weibo	2	2
Ustream	1	0
Livestream	1	1

**Table I.**  
Interconnectedness  
between government  
Web sites and social  
media platforms

and Ustream show few or no backlinks to their governmental parent sites. Additionally, most of these accounts on Instagram and Vimeo are inactive. It might be assumed that inactive accounts without backlinks are not official government accounts. A strong interconnectedness between the Web sites and social media accounts verifies, to a certain degree, the accounts' authenticity. However, a lack of backlinks to governmental Web sites or inlinks from government Web sites to active accounts does not imply fraud, as official government accounts can also be verified via government-specific labels, designs or content. Accounts without any activity and links (inlinks and backlinks) could not be reliably verified as official government accounts but are considered in our data analysis.

Another way of drawing users' attention to the government's social media activities is cross-linking between services. With the exception of Twitter, all services support the linking from account descriptions to other services. Table II shows the number of cities that outlink from one of their accounts to another social media presence and the number of cities that have an inlink from another used service on their account. We found out that there are only few links between the governments' social media services, which might be due to the services' limited linking options. For example, 13 cities link from another service to Twitter but just two of these accounts then established links to other services, probably because of Twitter's space limitations on account descriptions.

*Social media activity*

The third research question is dedicated to the activity of government accounts on social media platforms. This activity was measured via the amount of posted content on each service. Interactive activities, such as comments from users and retweets on Twitter, were not studied here as we focus on the governments' activity in our evaluation of the extent to which they use social media and of how much content they produce overall. The results can then be used as starting points for further studies examining the reactions of users and their degree of engagement with governments' accounts and content. However, the amount of posted content depends, for one, on the time span during which a service has been used and on the effort that has been made to create certain contents. Therefore, we calculated the average quantities of posted content per month, across all cities, for the following platforms: Twitter, Flickr, blogs, Instagram and YouTube. Weibo and Pinterest had to be excluded, as they do not provide account creation dates.

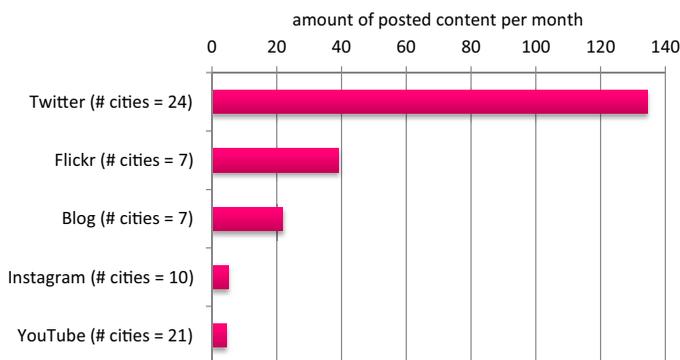
**Table II.**  
Interconnectedness  
between  
governments' social  
media accounts.

Social media platform	Outlinks to government account: no. of cities	Inlinks from government account: no. of cities
Twitter	2	13
Facebook	10	9
YouTube	7	6
Pinterest	6	5
Blogs	4	3
Google+	1	3
Flickr	0	3
Livestream	1	2
Instagram	1	2
Ustream	1	1

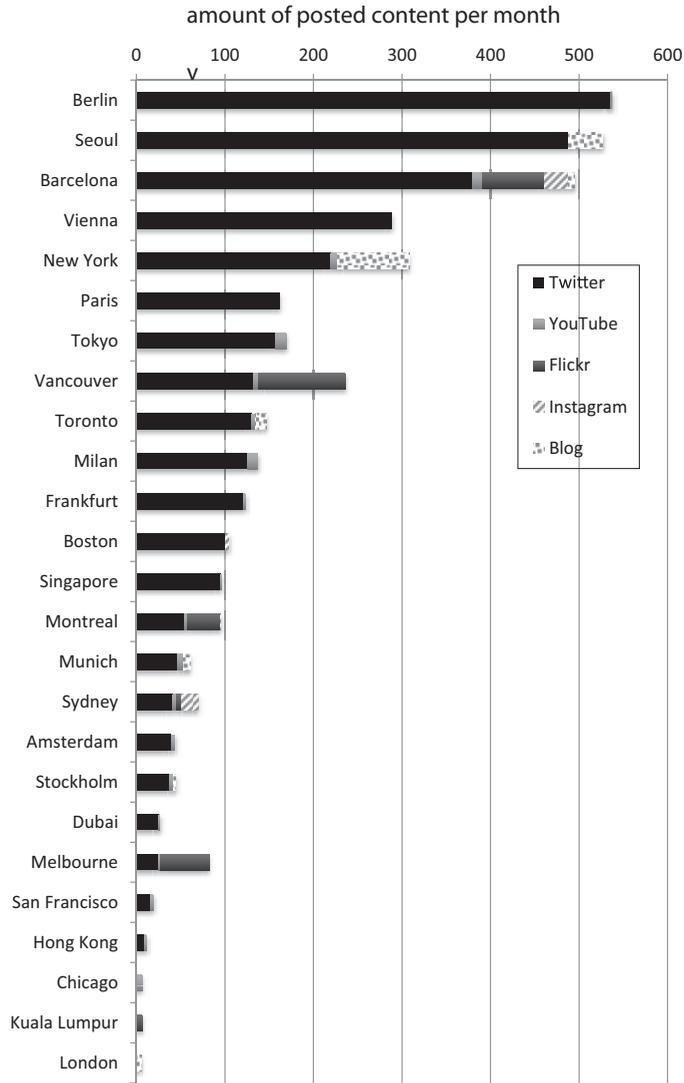
As shown in [Figure 3](#), the highest rate of activity was found on Twitter with 135 tweets per month and per city using Twitter. Flickr, with 39 pictures per month and city, is also used intensively and is more popular than Instagram with its five pictures. Surprisingly, blog posts (22 posts) are also very popular even though they take longer to produce than pictures or tweets. Each month, the 31 government accounts produce five videos on YouTube, which are often used to broadcast local events, news and reports.

[Figure 4](#) displays the amount of monthly published content on each social media platform for each city. The results show that there is a remarkable difference between the governments. Beijing, Shanghai, Helsinki and Sao Paulo contribute no content at all, and are thus excluded from our analysis. In contrast, the government accounts of Berlin, Seoul and Barcelona publish more than 500 posts per month. However, Berlin only publishes content on Twitter (563 tweets per month), whereas Seoul's strategy is focused on the two platforms Twitter and blogs, with nearly 500 tweets per month and 40 blog posts. Barcelona is the only city using all of the services displayed in [Figure 4](#) and is very active on Twitter (more than 300 tweets per month), Flickr (70 pictures per month) and Instagram (nearly 30 pictures per month). It is also represented on YouTube and blogs. Most of the cities use at least two services. Comparing posting activity with the number of used services ([Figures 4 and 2](#)) Barcelona is the only city which is placed high at both ranks. In all other cases, no direct relation between those both aspects can be found. Of crucial importance to our evaluation of the amount of content published by cities is their respective period of participation; hence, we also examined when the governments first started their activities in social media relative to the average starting time of all analyzed cities. As illustrated in [Table III](#), Sydney was the first city to register any social media accounts, i.e. official general government accounts on Flickr and YouTube. Flickr, Twitter and YouTube are the longest-used social media services over any average period of all government accounts. Stockholm was the first city to run a blog and a microblog. The first Facebook page was created by San Francisco in November 2008.

There are long time spans between the launches of social media services and their factual use by governments, e.g. Facebook was launched in 2004, but the average join date for governments was six years later, in 2010. Not before 2009, social media started to truly establish themselves in the business world ([Kaplan and Haenlein, 2010](#)) and in



**Figure 3.**  
Average activity of government accounts on social media platforms across cities per month



**Figure 4.**  
Cities' government activity on social media platforms per month

governments, many of which built up a systematic presence (Klang and Nolin, 2011). In contrast, services launched at a later date, such as Google+ and Instagram, were quickly adopted by governments.

The same behavior can be shown for Flickr or YouTube, where the time difference between the first cities' join dates and the average join date for all cities is more than three years. Twitter became a popular service among most cities almost at the same time as Flickr and YouTube, although Twitter's first government account was registered in August 2008. Cities have been actively blogging since January 2008, far earlier than they took up Facebook and Twitter. Less extensive and more recent usage numbers are

available for Ustream, Google+ and Instagram. Account creation dates for Weibo, Livestream, Pinterest, LinkedIn and Xing are missing because those services do not publicly provide this information.

*Followers and likes on social media platforms*

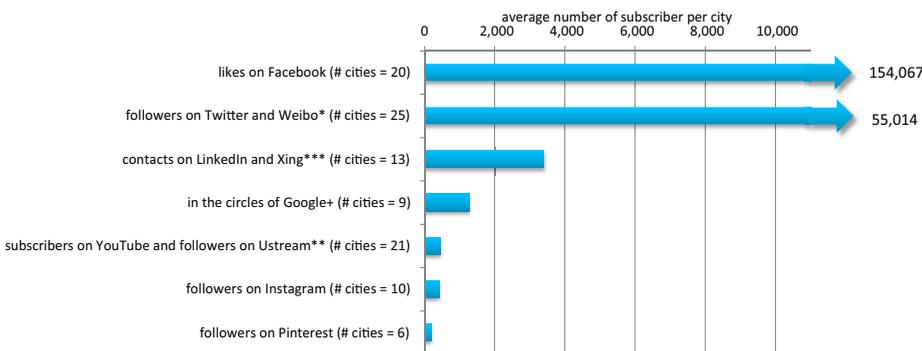
Our last research question regards the success of government accounts on social media platforms, and will serve to clarify whether government accounts adequately address social media users. Therefore, all accounts were examined with regard to their number of followers, likes, subscribers, etc., which can be compared to the number of unique visitors on a Web site with an additional news subscription. Almost all social media services provide information about their number of user subscriptions. Blogs are excluded, as they do not aim at forming a network of people. Subscriptions to blogs via RSS-Feeds are possible, but are not made visible on the blog itself.

As displayed in Figure 5, on average, there are about 154,000 likes for each city using Facebook. The average value is about 55,000 followers per city using Twitter. YouTube and Instagram with about 500 and Pinterest with 200 subscribers, on average, are of marginal importance in this area.

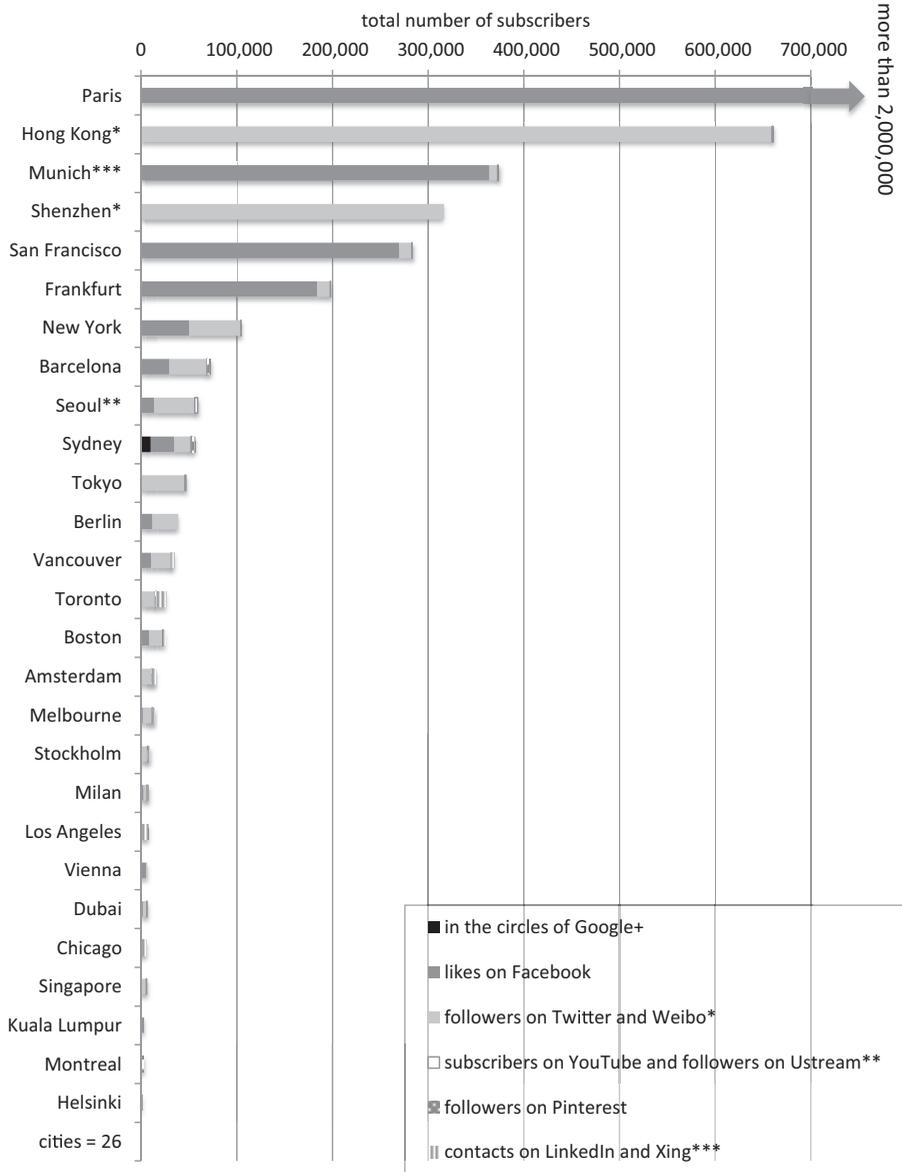
Figure 6 presents the summarized numbers of followers and likes for general government accounts on social media platforms per city. It is conspicuous that, at more than two million likes, Paris attracts far more Facebook likes than any other analyzed city. The government accounts on Facebook for Munich, San Francisco and Frankfurt all reach more than 180,000 likes as well. Although their social media activity is limited

Social media services	First government account online	Governments average entry date	Social media services' launch
Facebook	San Francisco in 11/2009	09/2010	02/2004
Google+	Melbourne in 11/2011	12/2011	06/2011
Twitter	Stockholm in 08/2008	11/2009	07/2006
YouTube	Sydney in 10/2006	11/2009	02/2005
Ustream	Seoul in 04/2011	04/2011	03/2007
Flickr	Sydney in 08/2006	11/2009	02/2004
Instagram	Toronto in 06/2011	01/2012	10/2010
Blogs	Stockholm in 01/2008	05/2010	Since 1990

**Table III.**  
When did analyzed cities create an account on social media platforms? comparison between the earliest and the average join dates of governments



**Figure 5.**  
Average number of subscribers per city on social media platforms



**Figure 6.**  
City-wise comparison  
of governments'  
number of  
subscribers on social  
media platforms

to Weibo, Hong Kong and Shenzhen reach about 600,000 and 300,000 followers, respectively. In general, the numbers of followers and likes differ greatly between the analyzed cities. Some cities, i.e. Paris, Hong Kong, Munich, Shenzhen, San Francisco, Frankfurt and New York, are very good at collecting subscribers online. The other cities only have very few or even minimal numbers of followers. Also when comparing follower numbers with the numbers of actions performed on the platform (e.g. publish

posts on Facebook) and used platforms, no relation can be found. Neither the highest monthly activity nor a high number of used services do necessarily lead to the highest follower numbers. So, we can conclude that neither social media activity (represented by the number of posts per day) nor social media presence (represented by the number of used services) might be the only reasons for Internet users to like or follow governments' accounts.

As has been observed in the case of activity numbers, users of government social media accounts concentrate on two or three services at the most when following or liking cities. Twitter and Facebook are the most-subscribed services by users, and also the most used services by governments. Conspicuously, YouTube, which is the third service with a high number of government accounts, only has a low number of subscribers.

## Discussion

Our analysis of government activities across social media was conducted for 31 Informational World Cities. The assumption was that cities which are important metropolises in the twenty-first century use social media services for government-to-citizen communication. Our results show that there are strong differences between the respective popularity of social media services for each city. The most-used social media platforms are Twitter, YouTube and Facebook. All in all, 14 (with Tumblr, 15) different social media platforms are used by the 31 cities. Twenty-nine cities use at least one of the social media services, and, on average, four services are used per government. However, governments reach 90 per cent of their total follower/friends numbers by only two services. To answer our first research question, it is not necessary to deploy as many services as possible to reach high numbers of followers.

Weibo is the most popular social network in Chinese regions (Deans and Miles, 2011), providing Twitter-like functionalities. Hong Kong and Shenzhen reach very high numbers of followers, placing second and third in this study in terms of subscribers, respectively. The two other Chinese cities, Shanghai and Beijing, do not use any social media service. This could be due to the access restrictions to globally accessible social media services imposed by China's Government. In contrast, Beijing and Shanghai have their own government microblogs under construction, presumably to exercise better content control with regard to their political practices. Hence, the comparability of results between Chinese cities and the others is not given.

Remarkably, many cities with government accounts on social media platforms do not link to them from their homepage. Some cities, like Helsinki, subscribe to another information policy and have a special webpage ([www.hel.fi/www/helsinki/fi/kaupunki-ja-hallinto/osallistu-ja-vaikuta/some](http://www.hel.fi/www/helsinki/fi/kaupunki-ja-hallinto/osallistu-ja-vaikuta/some)) where all social media activities are listed. It can probably be assumed that a lack of links from the government's homepage to its social media services hamper citizens' participation, which results in lower numbers for followers and likes (except for Hong Kong). Referring to our second research question, governments should make their social media activities visible by linking them on their Web sites. Likewise, it can be assumed that the linking between the services could help users to be pointed to different social media channels although this option depends on the services' features. In this study, Twitter is not only the most popular social media application (in terms of users liking content or following accounts) but also the service with the highest amount of activity (in terms of governments posting content). This is not surprising, as microblogging only takes a few seconds, in contrast

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to creating video clips for YouTube, which requires a greater effort. Therefore, the services' functionalities and differences in terms of usage cause different user behavior. This should be kept in mind when comparing user statistics and thinking about which services might be the most qualified for the government-to-citizen communication. So in regard to our third research question, the posting frequency should correspond with the type of service. However, no connection between the number of posts and the number of followers was found. Interaction numbers (i.e. comments) on Facebook were not considered in this analysis because of the lack of information on Facebook profile pages. Regarding followers and likes on social media platforms, Facebook is the most effective service in terms of animating users to like government profile pages, compared, for example, to Google+. However, Google+ is a very young service compared to Facebook or Instagram. Thus, it is not only the differences within the services that must be considered, but the services' periods of activity are equally important for deciding whether they are appropriate for government-to-citizen communication.

Whether governments do reach their stakeholders via social media (research question four) cannot ultimately be answered by this study. The indicators we studied (e.g. number of followers or friends) are considered proxies for user engagement, but not as evidence for causality. Therefore, they are only capable of showing tendencies for relationships between social media presences or activities and user response (that might stem from citizens as well as tourists and any other Internet user). However, an attempt to answer this question can be made if we assume that cities with a high population are more likely to obtain increased numbers of city-based Facebook users and likes. In both cases, a strong positive correlation between both values is to be expected. We found that the Pearson coefficient between the number of a city's inhabitants and the number of city-based Facebook users is  $r = +0.87$ , but  $r$  is  $-0.22$  when correlating the number of city-based Facebook users with the number of likes. The latter indicates that it is not necessarily the Facebook users based in the particular city who are responsible for the popularity of the Facebook page. Unfortunately, no other social media services provide the number of users per city, meaning that the city-wise correlation cannot be investigated further. When using the available numbers of a city's general population and the number of Facebook likes for government accounts, the Pearson correlation (two-sided) arrives at  $r = -0.26$ . In contrast, calculations with Twitter followers ( $r = +0.42$ ), as well as YouTube subscribers ( $r = +0.51$ ) and the number of the city's inhabitants show a stronger positive correlation. For the other services, only a low correlation was found. Due to the lack of city-specific user data, we used general population numbers for calculating the correlations between numbers of likes, followers or subscribers of a particular account. The results might be misleading, however, as social media services are available to every Internet user and not only to those based in the respective city.

To put it in a nutshell, our study showed that no Informational World City is more prominently active than all the others. Nevertheless, there are tendencies for each city to be more or less active on social media services. In general, more activity engages more users, but there are a lot of factors that can affect the numbers of followers and likes, as shown by the follower numbers of Paris, which outclass all other cities. For example, the type of posted content could be crucial: comparing cities being very successful on Facebook, e.g. Paris or Munich, with cities which do not reach many followers and friends, e.g. Vienna and Vancouver, we found that the successful ones posted many

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more photos, whereas the less fruitful ones posted mainly text and link posts. To fully understand this impression, a more in depth content analysis is needed. However, the cities' popularity and population size must also be regarded, e.g. Paris might be more popular than Helsinki in terms of tourism or events.

### Conclusion and future work

Twitter, YouTube and Facebook are the social media services most used by governments. Which services are most frequently used by users is difficult to examine due to several reasons. First, there is a lack of data concerning the services, which is why not all services could be compared. Second, there are differences in the services themselves, which results in divergent user behavior (e.g. concepts of likes and followers) and third, there are differences in the time spans of activity, e.g. upcoming services do not have numbers as high as those of established ones but can become very popular quickly. However, it can be assumed that regional and cultural differences, the visibility of governments' accounts, and the style of posted content will also influence users' behavior. Therefore, more research has to be done to examine the degree of these factors. Concerning activity, Twitter is the service with the highest number of posts by far, and in terms of followers and likes, Facebook and Twitter are of capital importance (United Nations, 2012). YouTube is conspicuous, in that almost all governments are present here but their accounts are less often subscribed to by their users. YouTube did not achieve high numbers for either activity or subscribers, although it is one of the top three services used by governments in Informational World Cities. Nevertheless, governments in Informational World Cities do reach users with their social media activities, provided they choose the most appropriate services for their government-to-user communication. However, only a few services achieve high numbers of users. Accordingly, we may conclude that only up to four services are sufficiently capable of reaching citizens. Furthermore, lower usage numbers do not have to be due to low user participation. Presumably, many users watch YouTube videos without subscribing to the respective YouTube channel. To summarize, governments should keep an eye on upcoming services and use those that their citizens also use. Additionally, cultural differences must be considered, e.g. Twitter does not work in Chinese regions.

What can we learn from the behavior of the governments of our paradigmatic cities of the knowledge society? What follows, are practically orientated recommendations for every government on city level concerning social media use:

- Deploy up to four social media channels! It seems to be helpful to bank on a microblogging platform (Twitter or Weibo), a social network service (Facebook), a video-sharing platform (YouTube) and an image-sharing service (Flickr or Instagram).
- Connect your governmental Web presence with your social media channels and vice versa!
- Search out an appropriate amount of your social media activities! The challenge is to find a balance between silence (too little activities) and over-touching the users (too many activities). Here are some hints as a rule of thumb: about 4 [...] 5 microblog posts a day, everyday 1 [...] 2 posts on your social network service (images are preferred over pure texts and link posts), about 40 new images a

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month on your image sharing service and about 5 films on your video-sharing service every month.

- Track the number of subscribers of your social media channels! Check the number of likes and comments of all your posts! (By the way, do answer questions, suggestions, etc. of your users!) Analyze the users' information behavior! The success factors of social media activities are not mere amounts of channels and posts, what counts is the content and its presentation. So learn what your audience wants to learn from you!

Our empirical investigation is the basis for further research. Especially the content of the actual accounts has to be analyzed in more detail (e.g. what type of information is provided by the governments), as well as the types of posts (e.g. are there text posts only or videos etc. as well?), and the user-created content (e.g. what do users post on government accounts). In addition, a more differentiated analysis of users must be conducted in the future to help governments choose the right services and, more importantly, the right contents to address their customers' needs. Do governments reach the "real" citizens who are interested in commenting and discussing about future visions of the city? or Are their followers more interested in beautiful pictures and nice places which should be visited. But although citizens can be reached by governments, it must be tracked whether online discussions are officially considered in the cities' governance or if social media services are only used to broadcast news.

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