Chapter 9
Greek Local E-Government 2.0: Drivers and Outcomes of Social Media Adoption

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Abstract Are Greek local governments moving towards e-government 2.0 model? What are the factors that impact adoption of Web 2.0 tools? What is the effectiveness of these tools in terms of citizens' awareness, interest, and engagement? The present study addresses these questions by investigating the usage and effectiveness of Web 2.0 applications employed by the 325 Greek local governments. Results indicate that local authorities in Greece are moving towards an e-government 2.0 era, albeit slowly. Local governments originating from municipalities with a large number of educated inhabitants who have made use of e-government services are more likely to be adopters of Web 2.0 tools. In addition, findings suggest that Greek citizens are beginning to be more aware of the Facebook pages of their local governments while they seem more interested in their YouTube channels. Hopefully, local governments can increase their citizens' engagement by being active on Facebook. Officials of local governments should increase their presence on social media such as Facebook and YouTube but their strategies should be differentiated for each social medium in order to benefit from their potential.

9.1 Introduction

During the Web 1.0 era, ICTs technologies did not manage to transform the traditional bureaucratic government model into a more participatory, deliberative, and citizen-centric model (Tat-Kei Ho 2002). However, the e-government 1.0 paradigm failed to enhance public participation (Scott 2006) as it focused on the digitization

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of administrative processes (Dixon 2010), information dissemination, service delivery, and cost reduction (Christensen 2013). Following a customer orientation approach, e-government 1.0 did not reach its maturity stage (i.e., e-participation and e-transformation) (Coursey and Norris 2008). However, expectations towards e-democracy models have risen again with the emergence of Web 2.0 applications. Interactive platforms such as social media have been described as "new innovative ways to deliver public value" (Linders 2012, p. 446) capable of reinforcing democracy and citizens' involvement in policy making (Larsson 2013).

The role of social media in spearheading political participation becomes even more vital for local governments since citizens feel more connected with their local authorities (Avery and Graham 2013). Despite the importance of social media in engaging citizenship in participatory democracy, their successful adoption by government agencies at the local level is relatively low. Moreover, empirical evidence suggests that a great amount of variability exists in the implementation of Web 2.0 platforms in municipalities around the globe. For example, studies in the United States have revealed high adoption rates of social media at the local level (Mossberger et al. 2013; Oliveira and Welch 2013). However, these interactive platforms have not been effectively employed by the US local governments which instead insist on using these interactive tools primarily as one-way communication vehicles (Norris and Reddick 2013; Reddick and Norris 2013). On the other hand, adoption of e-government 2.0 at the local level in Europe has not yet reached a stage of maturity. Bonsón et al. (2012) investigating 15 large European cities found that local governments are not utilizing to a great extent social media platforms. Low to moderate usage of social media platforms by local governments were also found in countries like Germany (Hofmann et al. 2013; Van Veenstra et al. 2011), Sweden (Larsson 2013), Finland (Christensen 2013), and Italy (Agostino 2013). In a similar vein, municipalities in Egypt have been exploiting social media in their web pages quite slowly (Abdelsalam et al. 2013) while poor levels of interactive communication were also found in the websites of several Mexican local government authorities (Sandoval-Almazan and Gil-Garcia 2012). Hence, few government agencies at the local level have fully exploited social media, and even fewer have yet actualized the potential offered by social media in engaging their citizens.

A number of prospective studies have been carried out in recent years about the use of social media by local governments. However, our knowledge about the way local governments are implementing social media strategies (Hofmann et al. 2013) and the derived benefits from such implementation (Guttormsen and Sæbø 2013) is limited. According to Larsson (2013), most of the studies on the use of social media by local governments have been conducted in the United States while more research is needed to explore the way local public administrations in other countries are utilizing social media. Greece presents an interesting case for the study of local government 2.0 even though evidence on the usage e-government 2.0 platforms in Greek municipalities remains scarce. The introduction of ICT in Greek public sector is dated back to the late nineties. Most of the Greek e-government initiatives at the municipality level have been focused around the (a) training of mayors and

elected officials in ICT, (b) development of digital services, and (c) implementation of management information systems (e-Government in Greece 2010). In 2005, 53 % of Greek local governments made use of websites in order to communicate with their citizenry (Drogkaris et al. 2010). At that time, most of the e-government tools used by local authorities in Greece focused on information provision rather on the interaction with citizens and the implementation of online transactions (Yannas and Lappas 2007, 2010). After the 2010 "Kallikratis Reform Program," the number of Greek municipalities was reduced from 1,031 to 325 resulting in decentralization of power across local authorities by strengthening the size and organizational level of them. This reform along with the limited funding for e-government initiatives due to the economic crisis places additional burden on the successful adoption of social media by local government in Greece. Hence, the purpose of this study is threefold: (a) to examine the extent to which local government of Greek municipalities are utilizing Web 2.0 applications, (b) to identify the various drivers of social media adoption at the local government level, and (c) to investigate which of Web 2.0 tools is the most effective in terms of citizens' awareness, interest, and engagement.

The present study is organized around eight sections. In the first section, the theoretical background of the study is provided which describes the impact of social media usage on e-government and e-participation, as well as the various social media strategies implemented by governments. Next, the conceptual framework is developed by presenting the findings of other studies regarding the drivers of social media adoption by local governments and the measurement of the effectiveness of social media tactics. Then, the methodology and the results of the study are analyzed followed by a critical discussion of the study's findings and a short conclusion. In the final section, the main limitations of this study are pointed out and future research suggestions are proposed.

9.2 Literature Review

9.2.1 E-Government 2.0: An Emerging Paradigm Shift

The introduction of Web 2.0 technologies in the public sector has been regarded as a turning point in the traditional e-government model (Chun and Reyes 2012). A typical e-government model evolves from initial stages of simple web presence and information dissemination to more transformational stages whereby citizens interact with government agencies, perform transactions, and participate electronically to the activities initiated by the government (Hiller and Belanger 2001; Baum and Di Maio 2000; Wescott 2001). Social media can advance and improve almost every stage of e-government by providing more opportunities for information diffusion (i.e., RSS feed), two-way communication (i.e., Facebook and Twitter), as well as political participation (i.e., online voting, online attention of public hearings) (Dixon 2010). Following the framework proposed by Christensen (2013) for the study of

e-democracy, it can be argued that Web 2.0 applications can contribute mainly to the two of the three democratic perspectives, that of participatory and deliberative democracy and not the representative perspective. Several researchers are optimistic of the potential social media have to move to more mature e-government models like Open Government or Government 2.0 (Chun et al. 2010); We-government (Linders 2012); and Social Government (Khan et al. 2010).

E-government 2.0 enthusiasts believe that social media can have positive effects not only for governments but for citizens as well (Chun and Reyes 2012). On the government side, interactive applications are a cost-effective and convenient way for information dissemination (Mossberger et al. 2013) and massive distribution of content to citizens (Bonsón et al. 2012). Social media can prove quite beneficial to local governments when they seek to inform citizens quickly for emergency matters (i.e., safety issues, natural disasters) (Kavanaugh et al. 2012). The increased penetration of social media such as Facebook helps local governments implement more egalitarian forms of governance, like reaching citizens who have never been involved in policy making before (Mergel 2012).

Local governments can also use social media to mine content generated from citizens about their attitudes and views on various issues (Abdelsalam et al. 2013). Crowd-sourcing opinions and ideas from citizens give local authorities the opportunity to effectively capture and manage citizens' critical knowledge which can serve as input in processes regarding public services design (Bonsón et al. 2012) and policy making (Mergel 2013). Besides mining citizens' generated content, local government can benefit from asking citizens for feedback about important community problems (Mergel 2012). This way, innovative solutions to important community problems can arise (Ferro et al. 2013) through citizens' engagement. In addition, interactive applications can help local governments find the most influential community members who are online and communicate with them more effectively (Kavanaugh et al. 2012). Increased transparency and accountability of local government initiatives are also other important benefits derived from the utilization of Web 2.0 technologies (Sandoval-Almazan and Gil-Garcia 2012). Moreover, relations between local governments can improve through the actualization of social media (Norris and Reddick 2013) resulting in a more networked (Mossberger et al. 2013) and integrated forms of governance.

On the demand side, all levels of e-participation (i.e., informing, consulting, advising, co-producing, and co-deciding) (Van Veenstra et al. 2011) could be enhanced through the exploitation of Web 2.0 applications at the local level. Specifically, citizens can become more informed (Chun and Reyes 2012) and interested (Mossberger et al. 2013) about local government activities and events. The interactive features of social media can advance the way citizens communicate with government officials as well as with other citizens (Kavanaugh et al. 2012; Bonsón et al. 2012), elaborating multi-party discussions (Mossberger et al. 2013), triggering the dialogue between citizens and local governments (Guttormsen and Sæbø 2013); thus, limiting the "distance" between citizens and local authorities (Hofmann et al. 2013) while cultivating stronger citizen-government relations (Avery and Graham

2013). Social media can enable more active forms of participation. For example, citizens can provide feedback to local authorities about new public services, thus becoming co-producers, co-designers, and co-developers of services (Ferro et al. 2013). As Linders (2012) notes citizens turn from passive consumers of public services to active participants in joint production of services. Moreover, citizens can be empowered to "participate in the public debate …and add issues to the political agenda" (Guttormsen and Sæbø 2013, p. 159). Co-deciding and collaborating with the local authorities about serious community problems is another important benefit derived from citizens' engagement with the social media used by local government (Mergel 2013). As a consequence, citizens feel that they have a say in local governance and become more involved with government activities. Increased involvement with local governments' social media heightens trust in local authorities resulting in greater public value (Tolbert and Mossberger 2006).

In Table 9.1, we summarize the possible benefits associated with the exploitation of Web 2.0 applications by local governments.

However, one should bear in mind that e-government 2.0 initiatives are not risk free. Several critics have cast doubt about the potential of social media in transforming government (Coursey and Norris 2008). Relying on opinions citizens upload on social media might endanger the outcomes of the policy-making process due to their low quality on substantive issues and lack of representativeness (Guttormsen and Sæbø 2013). Moreover, choosing policy requires knowledge and "attention to tradeoffs among values, to second-best possibilities, and to unexpected risks" (Weissberg 2001, p. 1) that citizens might not possess which in turn would lead to low quality policies. In addition the high penetration of social media along with the openness of their content runs the risk of issues slipping away out of the grid of local governments (Mergel 2013).

Table 9.1 Government 2.0 benefits

Supply side (Local government)	Demand side (Citizens)
• Effective information dissemination and massive distribution of content • Quick communication during emergency matters • Mining, crowd-sourcing of citizens' content • Efficient knowledge management • Influential marketing • Increased quality in local public services • Creative and innovative solutions of community issues • Transparency and accountability • Inter-government collaboration and integration	• Informed and interested citizens in local government activities • Increased involvement of nonelite individuals • Better interaction and dialogue between citizens and government • Stronger relations between citizens and government • Co-designing of local public services • Co-deciding about major community issues • Participation in public debates and agenda setting • Trust in local governance and greater public value

9.2.2 Social Media Implementation Strategies

According to Mergel (2013), local governments adopt social media for a number of reasons which are associated with the type of management and their organizational culture (Guttormsen and Sæbø 2013). Local governments which follow a citizen-centric approach might want to have the presence on social media in order to be where their citizens are, thus, satisfying their communication desires. On the other hand, several local governments decide to enter the social media arena simply because other local agencies have done so successfully. Last, there is the group of local governments termed late adopters that currently trail behind in social media adoption but through forced implementation induced by central government initiatives are expected to cover the distance in the future.

Most of the times implementation of social media by government agencies is a three-stage process (Mergel and Bretschneider 2013). During the first stage, few government employees set social media accounts for their departments or agencies unofficially. These social media innovators mainly use social media to disseminate information and interact with citizens in an informal manner. During the second stage, social media innovators begin to set informal guidelines for the use of social media which in the third stage are transformed into official protocols. Specifically, in the third stage the use of social media becomes more institutionalized and even new roles and departments might appear for the successful exploitation of social media.

Nowadays, as Ferro et al. (2013) note, government agencies are moving from simple social media practices such as creation of accounts and posting of updates manually, to more sophisticated ones like cross-posting of the same content to different social media platforms and data mining of citizen-generated content. Depending on their communication goals and the available resources local governments can pursue three basic social media strategies, namely: representation, engagement, and networking (Mergel 2013). By implementing a representation strategy local governments set accounts to popular social media (i.e., Facebook, Twitter, and YouTube) in order to provide top-down information to their citizens and massively distribute content about their initiatives and activities. This strategy does not enhance citizens' engagement and participation. Through the strategy of engagement local government try to interact with their citizens in order to co-produce and share with them critical content. The pursuit of this strategy requires the active role of the local government. Networking strategy aims at monitoring the opinions and views of citizens by facilitating interaction and dialogue between the various stakeholders of a local community. The active participation of local authorities in the online dialogue is not a necessity for the implementation of this kind of strategy. It should be noted that both engagement and networking strategies trigger citizens' participation.

9.3 Conceptual Framework

9.3.1 Drivers of Social Media Adoption

Several studies have tried to shed light on the factors that affect the adoption of Web 2.0 applications by government agencies at the local level. These factors are related to municipality (i.e., size, region), local government (i.e., structure), and citizens' characteristics (i.e., voters' turnout, internet usage, education). In the context of the United States, Norris and Reddick (2013) confirmed the effect of population size and region of the municipality on the adoption of social media by local authorities. Moreover, Oliveira and Welch (2013) reported a positive relation between the existence of an internal IT department and the implementation of social media practices by local government officials. Rather, the size of the municipality had no effect on social media usage. In a more recent study of Reddick and Norris (2013), the positive impact of citizens' education and year of website creation on adoption of e-government 2.0 initiatives was confirmed while a nonsignificant relationship was found between the existence of an IT department and the utilization of Web 2.0 technologies by local authorities. Citizens' education was also found to play an important role on the adoption of Facebook by municipalities in Sweden (Larsson 2013). Furthermore, the study of Larsson (2013) revealed a positive association between the size of the municipality and the usage of social media like Facebook, Twitter, and YouTube. Twitter adoption by Swedish local governments was also positively related with the level of citizens' Internet usage but negatively associated with voters' turnout. It seems that, in municipalities with high abstention levels local governments try to create bonds with citizens through extensive use of social networking sites (SNSs). Christensen (2013) investigating municipalities in Finland found that the size of municipality (i.e., population) affects the adoption of e-democracy applications (i.e., discussion forums, and commenting) by local governments. On the contrary, the study of Bonsón et al. (2012) regarding 15 European cities, found no evidence that factors such as citizens' access to Internet services and usage of e-government 1.0 services affect implementation of e-government 2.0 initiatives which are primarily influenced by local government's previous implementation of e-government 1.0 applications. Hence, research so far has produced contradictory results regarding which factors have a significant effect on the adoption of e-government 2.0 features. To shed more light on the drivers of e-government 2.0 adoption, the present study will address the following research question:

RQ1: What are the drivers of the adoption of e-government 2.0 applications by local governments in terms of (a) municipality characteristics such as size and tourism activity of the municipality, (b) local governments' characteristics such as operation of an internal IT department, and (c) citizens' characteristics in a given municipality such as the level of internet usage, the use of e-government services, the level of higher education and the voters' turnout.

9.3.2 *Citizens' Participation Through Social Media: Myth or Measurable Reality*

A number of studies claim that e-government 2.0 initiatives haven't triggered yet enough citizens' engagement and participation. Nevertheless, it should be noted that the majority of these studies measure engagement from the supply side by examining the presence of interactive applications in governmental websites and the existence of active social media accounts. Perhaps, citizens' apathy towards the interactive platforms of local governments is associated with improper use of social media platforms since government officials lack the skills and the knowledge for identifying the characteristics of their target audiences in order to interact with them in an effective manner (Kavanaugh et al. 2012). For example, Snead (2013) found that social media like blogs do not connect citizens with local authorities. Moreover, low engagement of citizens could also be related to the type of content posted on social media. As Hofmann et al. (2013) revealed citizens' interest and engagement increases when content such as photos and videos is posted on governmental social media.

So far, little is known about whether and which e-government 2.0 applications are successful in enhancing citizens' engagement and participation. Another critical issue that hasn't received enough attention by researchers is the way success (i.e., engagement, participation) is measured in social media tools used by local governments. Abdelsalam et al. (2013) measured success of a local government's Facebook profile in terms of page popularity and page effectiveness. Specifically, page popularity considered the number of page likes, posts, and "talking about" while page effectiveness was evaluated by dividing the number of people talking about the page with the number of people who have liked the page. In another study, Hofmann et al. (2013) measured success by counting the number and the polarity of comments posted by citizens on the Facebook pages of local governments. Agostino (2013) differentiated citizens' engagement with the social media of local governments from citizens' awareness. Awareness of social media platforms included items such as the number of Facebook page likes, Twitter followers, and YouTube subscribers per inhabitant. The metric of social media engagement was evaluated using three variables (a) number of Facebook "talking about" per friend, (b) number of tweets per follower, and (c) number of YouTube comment per subscriber. As Snead (2013) highlights, the count of tweets, Facebook posts, and uploaded videos on YouTube are not indicators of citizens' engagement with the social media of local governments since one cannot tell if connected citizens have read the posts and tweets or have viewed the videos. More appropriate measures of participation should evaluate the number of likes or comments per post on Facebook; the number of Re-tweets per tweet; and the number of views per uploaded video.

We herein posit that engagement of citizens with the social media of local governments is a three-stage process. During the first stage, a state of awareness about the presence of social media is created to citizens. This awareness level could be measured by evaluating the number of Facebook friends/page likes, Twitter

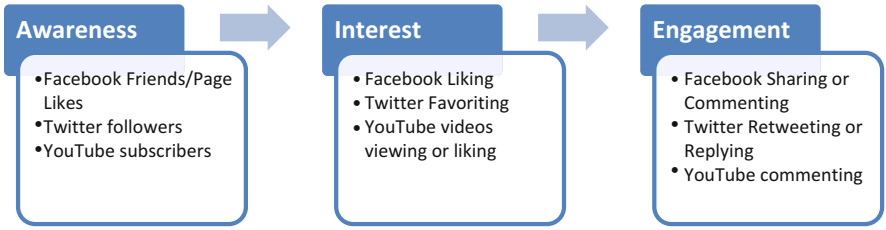

Fig. 9.1 Process of citizens' engagement with the social media of local governments

followers, and YouTube subscribers. As local governments exploit social media by posting, tweeting, and uploading videos citizens become more interested in the content and updates of their municipalities. Citizen interest could then be evaluated by considering the number of Facebook likes, Twitter favorites, YouTube video views or likes. At the final stage, citizens actively engage with the social media of local authorities. This engagement-participation is reflected on citizens' activities such as Facebook sharing or commenting, re-tweeting or replying on Twitter, and commenting on YouTube. Figure 9.1 illustrates the aforementioned engagement process.

With the aforementioned in mind, the present study will also try to answer the following research questions:

RQ2: Which social media platform (i.e., Facebook, Twitter, YouTube) is the most effective in terms of citizens' awareness, interest, and engagement?

RQ3: Is social media activity of local governments associated with citizens' awareness, interest, and engagement?

9.4 Methodology

The sample for this study consisted of the 325 Greek municipalities. Data collection took place from June to August 2014 and was conducted in two phases. During the first phase, data regarding general characteristics of each municipality (i.e., size, tourism industry, operation of IT department, internet usage, usage of e-government services, voters' turnout) were gathered from various sources such as the websites of the Ministry of the Interior (www.ypes.gr) the Hellenic Statistical Authority (www.statistics.gr), and the Observatory for the Greek Information Society (www.observatory.gr). The variables of the study were operationalized as follows:

- *Size*: Number of inhabitants as recorded in the 2011 Census of Population.
- *Higher Education*: Percentage of inhabitants with bachelor's or master's degree or doctoral diploma of each municipality.
- *Voters' Turnout*: Percentage of citizens who voted at the first round of the May 2014 Municipal Elections of each municipality.

- *Internet Usage*: Percentage of internet users in the prefecture of each municipality.
- *Usage of e-government services:* Percentage of individuals who have used e-government services in the prefecture of each municipality.
- *Tourism and Travel Industry Municipality*: Coded 1 if the municipality was characterized as a tourism and travel industry and 0 otherwise. Based on the Presidential Decrees of 899/76 and 664/77.
- *Operation of an Internal IT department*: Coded 1 if an Internal IT department exists in the organizational chart which appeared on the websites of the municipalities and 0 otherwise.

During the next phase, researchers examined whether each municipality had a Facebook profile or page, a Twitter account, and a YouTube channel. Nonofficial accounts were excluded from analysis. For each Facebook page, the total number of page likes, posts, likes on posts, and comments on posts were collected. We limited our analysis to the first 1,000 posts of each account. Moreover, we did not include the number of likes on users' comments. In a similar way, for municipalities with an official Twitter account the total number of followers, users who are followed, were tweets, favorites, and re-tweets were retrieved. It should be noted that we did not include tweets that were re-tweets from other accounts. Regarding YouTube channels, the total number of subscribers, videos uploaded, views, and comments were calculated.

Following a similar procedure with those reported in the studies of Bonsón et al. (2012), Mossberger et al. (2013), and Abdelsalam et al. (2013) a summative index was developed in order to measure the usage of social media by Greek local governments. The index was named Social Media and included three variables namely: Facebook page, Twitter account, and YouTube channel. This social media index could take values from 0 if the local government had no presence in any social medium to three if it exploited all three social media.

Citizens' awareness was measured by dividing the number of Facebook page likes, Twitter followers, and YouTube subscribers by the population of each municipality. Citizens' interest index calculated the number of Facebook likes on posts, Twitter favorites, and YouTube video views divided by the number of Facebook posts, tweets, and YouTube videos. Lastly, citizens' engagement was evaluated by dividing the number of Facebook comments on posts, Re-tweets, and YouTube comments by the number of Facebook posts, tweets, and YouTube videos.

9.5 Results

The majority of the Greek municipalities (75.1 %) were medium sized in regard to their population (between 10,000 and 249,000 inhabitants) and only two of them (Athens and Thessaloniki) were regarded as large municipalities. In addition, 33.3 % of the municipalities were classified as tourism and travel industries and 36.3 % had an internal IT department. As Table 9.2 shows, social media presence of

Table 9.2 Usage of social media by Greek municipalities

Social media usage	Frequency (Percentage)
Facebook profile	54 (16.6)
Facebook page	92 (28.3)
Twitter account	67 (20.6)
YouTube channel	71 (21.8)

Table 9.3 Social media index

Social media index	Frequency (Percentage)
0	144 (44.3)
1	107 (32.9)
2	45 (13.8)
3	29 (8.9)

Table 9.4 Regression analyses results

Variables	Social media index B
R^2 (%)	6.0
Size	0.160[a]
Tourism and travel industry	0.033
Higher education	0.132[a]
Voters' turnout	0.072
IT department	0.068
Use of Internet	−0.043
Use of e-government services	0.053

[a]Significant at $p<0.05$

municipalities was low. Of the 325 local governments 92 (28.3 %) of them had an official Facebook page while 54 of them had a Facebook profile (16.6 %). The use of Facebook profiles instead of Facebook pages is indicative of an informal and unofficial approach in the exploitation of this SNS. The second most frequently used social medium was YouTube (21.8 %) followed by Twitter (20.6 %).

Regarding social media presence, 44.3 % of the municipalities had no presence in any of the three SNSs (Table 9.3). In addition, 46.7 % of local governments were users of one or two SNSs and only 8.9 % of them had a presence on the three social media (i.e., Facebook, Twitter, and YouTube).

In order to answer the first research question a regression analyses were conducted. The dependent variable for the model was the social media index. Table 9.4 shows the results of the regression analysis. The R square value for the model was 6.0 % implying that other independent variables may exert influence upon the dependent variable which has not been included in the present model.

Regarding the regression model, results indicate that social media adoption index was significantly ($p<0.05$) and positively influenced by the size of the municipality ($\beta=0.160$, $p=0.006$) and the percentage of citizens with higher education ($\beta=0.132$, $p=0.017$). However, the value of the standardized beta coefficient was low. Nonsignificant effects ($p>0.05$) were found between tourism activity ($\beta=0.033$,

Table 9.5 Social media metrics

Facebook	Mean	Twitter	Mean	YouTube	Mean
Metrics		Metrics		Metrics	
Years since creation	2.20	Years since creation	2.03	Years since creation	2.24
Page likes	1,005.00	Followers	149.2	Subscribers	28.40
Talking about	79.88	Following	77.87	Views	352.0
Posts	321.72	Tweets	375.05	Videos	31
Links	143.29	Photos	12.58	Comments	0.15
Statuses	35.04	Favorites	4.71		
Photos	130.49	Re-tweets	8.70		
Videos	10.78	Replies	0.00		
Post likes	4,763.9				
Post comments	125.0				
Post shares	934.0				

$p=0.556$), voters' turnout ($\beta=0.072$, $p=0.194$), operation of an IT department ($\beta=0.068$, $p=0.234$), percentage of Internet users ($\beta=-0.043$, $p=0.457$), percentage of e-government services usage ($\beta=0.053$, $p=0.335$), and social media adoption index. Thus, addressing the first research questions it can be argued that important drivers of social media adoption by Greek local municipalities are the size of municipality as well as the percentage of citizens with higher education in a given municipality.

Of the 92 Facebook pages, 12 were inactive with no content posted by local governments. Similarly, 12 pages were highly active since they posted more than 1,000 posts from the date of their activation. Most of these 12 active accounts derive from medium-sized local governments (91.7 %). As Table 9.5 shows, on average local governments with a Facebook page posted 321 messages—during a 2-year period since the activation of the account—which were mainly links and photos. Moreover, Facebook pages were visible to 1,005 citizens and received 4,763 likes; 135 comments and 934 shares on average. Regarding Twitter activity of the 67 Twitter accounts only three were inactive while seven of them had more than 1,000 tweets. Intense twitter activity was found originating from local governments mainly in the regions of Attica and Crete (five out of seven). On average, local governments were visible to 149 followers, tweeted 375 times and received five favorites and nine re-tweets during a 2-year period since the activation of the account. As for YouTube activity, only one account was inactive and had no videos uploaded. On the other hand, 6 local governments were highly active on YouTube platforms since they posted more than 100 videos from the date of the account activation. On average, local government had 28 subscribers and posted 31 videos which were viewed 352 times during a 2-year period. Based on the analysis above, it seems that activity of local governments on Facebook outpaced the other two social media channels.

In order to answer the second research question, repeated measures analysis of variance was used to compare the citizens' awareness, interest, and engagement

Table 9.6 Repeated measures analysis of variance results for awareness, interest, and engagement

	Mean values		
Social media	Awareness	Interest	Engagement
Facebook	0.036	5.167	0.328
Twitter	0.008	0.087	0.099
YouTube	0.001	80.35	0.000
Geisser-Greenhouse	0.520	0.503	0.609
F—value	13.61[a]	14.95[a]	8.194[a]

[a]Significant at the $p=0.05$ level

across the three social media (Table 9.6). As Table 9.6 shows, low levels of awareness of and engagement with social media used by local government were found while citizens' interest to these SNSs was modest.

In regard to citizens' awareness, the Geisser-Greenhouse correction of the F distribution was used for the test of significance. Based on the results, there were significant differences at the $p<0.05$ level of significance, in the awareness of citizens across the three social media [$F(0.016, 1{,}039)=13{,}617$, $p=0.001$]. Bonferroni's post hoc tests were performed to test the differences in awareness level between each pair of social media. Citizens' awareness of the local governments' Facebook pages was significantly higher ($M=0.036$) than their awareness of Twitter accounts ($M=0.008$) and YouTube channels ($M=0.001$). Moreover, Twitter scored significantly higher on the citizens' awareness index compared to YouTube. Following, the same procedure as described above, significant differences at the $p<0.05$ level were found in the citizens' interest index across the three social media [$F(28{,}282, 1{,}007)=1{,}946$, $p=0.008$]. Based on the Bonferroni's post hoc tests, citizens' interest was significantly higher ($p<0.05$) for the YouTube channels of local governments ($M=80.35$) than for the Facebook pages ($M=5.167$) and the Twitter accounts ($M=0.087$). On the contrary, no significant differences were found in the citizens' interest scores ($p>0.05$) between Facebook and Twitter accounts. As above, the three social media differed significantly in regard to the level of citizens' engagement [$F(1{,}189, 1{,}218)=8.194$, $p=0.006$]. The Bonferroni's post hoc tests indicate that citizens tend to engage significantly more with the Facebook pages of local governments ($M=0.328$) than their YouTube channels ($M=0.001$). However, Twitter ($M=0.099$) did not differ significantly ($p<0.05$) in the level of citizens' engagement from Facebook and YouTube. Hence, it can be concluded that citizens are more aware of and engaged with the Facebook pages of local government while they seem more interested in their YouTube channels.

Next, a correlation analysis was performed using the Pearson's correlation coefficient to answer the third research question about whether social media activity as reflected by the number of Facebook posts, tweets, and YouTube videos is significantly related with the level of awareness, interest, and engagement of Facebook, Twitter, and YouTube, respectively. Results indicate that the number of Facebook posts is significantly correlated ($p<0.05$) with the awareness ($r=0.264$, $p=0.011$),

interest ($r=0.446$, $p=0.000$), and engagement ($r=0.458$, $p=0.000$) of citizens with the Facebook page of local governments. It seems that when local government update frequently their Facebook accounts their connected citizens become more interested and engaged with their activities. On the contrary, no significant association ($p>0.05$) was found between Twitter activity and citizens' awareness ($r=0.222$, $p=0.071$), interest ($r=-0.183$, $p=0.162$) as well as engagement ($r=-0.227$, $p=0.081$) with the Twitter accounts of local governments. This non-effect could be attributed to the fact that Twitter is not a frequently used tool by Greek citizens in general. Regarding YouTube, the number of videos uploaded by local governments was significantly ($p<0.05$) correlated in a positive way with citizens' awareness ($r=0.323$, $p=0.007$). No significant correlation ($p>0.05$) was found between YouTube activity of local governments and citizens' interest ($r=-0.305$, $p=0.179$) and engagement ($r=-0.010$, $p=0.079$). The correlation between YouTube activity and citizens' awareness of the YouTube channel of local governments was modest. Thus, when local governments are uploading frequently videos about their activities more citizens are attracted to their YouTube accounts.

9.6 Discussion

The present study investigated the usage and effectiveness of social media exploited by Greek local governments. Evidence suggests that local authorities are moving towards e-government 2.0 era, albeit slowly. Results suggest that the exploitation of social media by local governments is still in its infancy and at their first stage of development (Mergel and Bretschneider 2013) since the majority of municipalities were not present on social media. For example, only 28 % of Greek local authorities own a Facebook page while almost 20 % of them are active on Twitter and YouTube. Hence, this small number of local governments which are active on social media could be characterized as innovators that probably might set the pace and other local governments might follow. Possible reasons for this low exploitation of Web 2.0 tools by Greek local governments could be attributed to their bureaucratic model of governance as well as the lack of resources and personnel. Note, that although Greek municipalities lag behind their counterparts in the United States where Facebook's penetration is over 90 % and Twitter's over 60 %, they go in hand with other European countries (Bonsón et al. 2012). Similar levels of social media presence with those found in the present study were reported for local municipalities in Italy (Agostino 2013) and Sweden (Larsson 2013).

The size of municipalities plays a significant role in the adoption of Web 2.0 applications. Specifically, municipalities with a large number of inhabitants tend to use more extensively Web 2.0 applications in order to distribute content and updates about their activities massively and quickly. Moreover, it seems that densely populated municipalities made use of Web 2.0 applications to reduce the spatial distance from their citizens by being where their citizens were and facilitating dialogue. The impact of population on local government's use of Web 2.0 tools was also reported in other studies (Norris and Reddick 2013; Christensen 2013). This study also

revealed that municipalities with educated citizens are adopters of social media such as Facebook, Twitter, and YouTube. Hence, education impacts not only on the adoption of e-government 1.0 (Jaeger 2003) but of e-government 2.0 as well (Reddick and Norris 2013; Larsson 2013).

The present study also tried to shed light on the critical debate that exists on whether e-government 2.0 initiatives undertaken by local governments can enhance more participatory forms of democracy by actively engaging citizens. Based on the results of the present study, the social media tools used by Greek local governments performed poorly on citizens' engagement. Note, though, that there is evidence which suggest that by enhancing social media activity especially on Facebook, citizens' participation could be increased. Of special interest is the finding that a YouTube video, viewed 80 times on average, triggers the interest of Greek citizens more than a Facebook post, liked five times on average. Greek citizens are not aware of the social media activities of their local authorities with only 4 % of a municipality's inhabitants being aware about the local government's Facebook page. A closer look at the study's results reveals that although social media activities of government agencies at the municipal level are not well known to citizens, those who choose to connect with them are highly interested and supportive of such activities. This finding could be attributed to the low rates of Twitter (8 %) and YouTube (8.8 %) usage by Greek citizens (FocusBari 2014).

It is imperative for Greek local governments to move to the next stage of the e-government 2.0 model by increasing their exploitation of the new innovative and interactive tools. Local governments' social media presence should be enhanced. It should be noted, that for the exploitation of social media, government agencies should develop formal social media strategies that will be implemented under the supervision of personnel with high expertise on the area. Moreover, strategies should be differentiated for each social medium in order to benefit from their different characteristics. For example, Facebook should be preferred when local governments want to disseminate and inform massively Greek citizens since Facebook scored high in citizens' awareness compared to the other two SNSs. Furthermore, if local governments want to monitor the attitudes or pulse of their citizenry, relevant content should be disseminated in the form of YouTube videos as it was found that this video sharing application scored high in the level of citizens' awareness. In addition, uploading various versions of videos about a critical matter could further enhance citizens' awareness. When more active forms of participation from citizens' side are needed such as comments or dialogue, then efforts should focus on providing continuous updates about the relevant issues in the form of Facebook posts.

9.7 Conclusions

The present study explored the exploitation of social media by Greek local governments as well as their effectiveness in terms of citizens' awareness, interest, and engagement. Social media adoption by local governments in Greece was found to be low with almost 28 % of the municipalities maintaining a Facebook page.

YouTube and Twitter were adopted by almost 21 % of the investigated local authorities. Another indication of the low extent of social media usage was the limited social media sophistication of the Greek local governments since a minority of them (9 %) were present on the three social media platforms (i.e., Facebook, YouTube, and Twitter). The main drivers of social media adoption by local authorities in the Greek context were related to the size of the municipality as well as the education level of citizens in a given district. In general, social media used by Greek local governments were not highly visible to citizens. Moreover, it can be argued that the way these Web 2.0 platforms were used by municipalities did not attract the interest and involvement of the local community members. However, certain social media proved to be more effective in terms of citizens' engagement than others. For example, Facebook was found to be the most effective platform in reaching audiences in a massive way as well as in engaging citizens through sharing and commenting content. In addition, YouTube proved to be a successful medium for evoking the interest of citizens through viewing videos uploaded by local governments. Nonetheless, through frequent content updates municipalities can increase the level of citizens' awareness of and engagement with their Facebook pages. Citizens' interest could also be enhanced through frequent video uploads on the YouTube channels of local governments. Finally, contrary to our expectations Twitter scored pretty low on citizens' awareness, interest, and engagement.

9.8 Limitations and Future Research Suggestions

The main limitation of the present study is its non-exhaustive nature. Since this study focused only on several website applications and social media other Web 2.0 tools such as (e-polls, discussion forums, blogs) could be included in a future survey. In addition, this study focused on the supply side of e-government 2.0. More research from the demand size is needed to further determine the attitudes of Greek citizens towards e-government 2.0 initiatives and their intention to actively engage with them. Simply counting likes, favorites, and comments does not guarantee that attitudes and behavior of citizens are captured, since other stakeholders such as nongovernment agencies could also engage with the social media of local governments (Snead 2013). Comparing social media actualization of local governments across Europe could also provide a better view about the usage and effectiveness of e-government 2.0 adoption. Moreover, the proposed three-stage model for the measurement of citizens' engagement should also be validated or enhanced by implementing it across different countries.

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