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ARTICLE

Web 2.0 and Social Media Growth in Planning Practice: A Longitudinal Study

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Abstract
This paper looks at the growth of web-based communication for planning practice in local government over a three-year period. Despite communication with the community being an integral part of local government functions, the types of communication being used are rarely monitored or analysed. This paper provides a longitudinal comparison of the types of web-based communication, including social media and smartphone applications being employed by local government in New South Wales, Australia, and investigates the activity and sentiment of Twitter accounts for a sample of local government agencies. The paper concludes with a discussion of the growth of social media.

Keywords: public participation; social media; Internet; sentiment analysis; Australia

1. Introduction

Many of us conduct a significant part of our lives online paying bills, ordering groceries, booking travel, biding on auctions and catching up with long lost friends. The extent to which modern society has become reliant on online services influences the way in which people communicate with one another and the way we conduct our lives (Wellman & Haythornthwaite, 2002). The specific focus of this paper is web-based communication for planning practice in local government. Despite communication with the community being an integral part of local government functions, the types of communication being used are rarely monitored or analysed. This paper provides a longitudinal comparison of the types of web-based communication being employed by local government in New South Wales (NSW), Australia, and then further investigates social media, specifically using Twitter sentiment analysis. We begin by reviewing the U.S.-based studies that this paper seeks to make a comparison with and then move onto the study area and recent research and planning practice activities that have a specific focus on social networking tools such as Facebook and Twitter and the emerging use of smartphone applications. We then provide details of the longitudinal comparison of web-based communication by local government in the state of NSW followed by sentiment analysis of 12 local government Twitter accounts. Essentially, this research seeks to link the *deliberative* (Forster, 1999) and *consensus building*

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(Innes, 1996) concepts of planning theory to the emerging use of online communications, to discover what the implications of these technologies may be on planning practice.

2. Literature Review

Healey (1993) refers to a shift from a modernist to a post-modernist view of planning as the *communicative turn in planning theory*. This shift is described by Harris (2002) as a re-orientation from technical planning models towards a more interactive understanding of planning activity. Others have further developed the area of communicative planning and added terms such as *deliberative planning* (Forster, 1999) to facilitate practical and timely participation and *planning through consensus building* (Innes, 1996) as a form of negotiation and mediation in planning processes. While literature discusses and debates communication in planning theory, this paper focuses on how the Internet delivers information and services to facilitate planning processes and how it promises to increase community understanding of planning, while also increasing the number of participants in the negotiation of planning decisions. A number of recent studies have been undertaken to measure the extent to which local government engages with its respective communities electronically. To gain an understanding of how local government communicates with its community via the Internet, a number of communication models have been utilized, with this study using an Internet communications model developed by McMillan (2002).

Evans-Cowley and Conroy (2006) categorized typical U.S. Municipal Council website functions into the four-part model developed by McMillan (2002), with the council being the sender and citizen being the receiver. Evans-Cowley and Conroy's (2006) conclusions were firstly, that the *monologue* approach is the most common form of communication because it saves time and costs to the council and is relatively simple to implement. Secondly, *responsive dialogue* and *mutual discourse* are challenging both technically and financially, with little expertise employed in-house. Thirdly, citizens have increasing expectations for planning websites, with the public regularly enquiring about information availability. And finally, a small portion of local government provides the full array of communications. Likewise, Simpson (2005) conducted a large survey of U.S. local government as a representation of the various interactions that occur between government and citizens, observing that planning is a unit of local government that most often affects people at the property level and actively seeks community input on planning issues (Simpson, 2005). Simpson concludes that the majority of U.S. planning agencies are not using web-enabled technology to engage the public in discourse, rather they provide a one-way communication channel in the form of static documents and maps. Furthermore, most planning agencies are considering the adoption of more interactive applications, but most activity is focused on basic information. It is unclear what forces, technological or otherwise, will push agencies towards more interactivity (Simpson, 2005). Walsh (2009) suggests that innovative communications are not limited by their ability to implement new systems and infrastructure, but perhaps the most important factor is a genuine understanding at the management level of the benefits that could be gained.

More recently, Evans-Cowley and Conroy have transformed their 2003 study into a longitudinal study that reviews Municipal Council websites on an annual basis. Evans-Cowley and Conroy's (2009) latest results conclude that municipal planning websites are still dominated by simple monologue information, although the number of municipalities offering this information has increased between 2003 and 2007. Municipalities are also experiencing significant technical and financial challenges in adding tools such as interactive geographic information system (GIS) and e-commerce to their sites, due to planning department staff being responsible for maintaining the websites. Finally, there is evidence of an increase in online participation tools, although the number of municipalities offering discussion forums and special interest group listservs has decreased since 2003. Evans-Cowley and Conroy (2009) conclude that all levels of government are facing continuing challenges to be more responsive to their citizens and engage them in decision-making; however, the success of online participation tools is tied to the public's use of these services.

An area of online participation that has emerged since the initial studies by Evans-Cowley and Conroy (2006) and Simpson (2005) is social networking, which includes Facebook, MySpace and Twitter. The use of Facebook can be broken into two separate groups of *Government-initiated* and *Citizen-initiated social networks* (Evans-Cowley, 2010; Evans-Cowley & Hollander, 2010). Citizen-initiated social networks focusing on planning issues form the majority of social networks found by Evans-Cowley (2010), and were typically organized to oppose a proposed development or draft plan. Facebook is a popular social network that attracts millions of users across the world; however, the use at a personal level may not constitute what is required for participation in planning processes, due to people's interpretation of what a *friend* is, and their belief that simply joining a network is an action for a cause. Furthermore, the slow take-up of social network tools such as Facebook may also be attributed to local government employees actually being banned from accessing the site from work equipment (Evans-Cowley, 2010).

3. Study Area

The study area for this research is the state of NSW, which is located on the east coast of Australia (Figure 1). Almost one in three Australians resides in NSW. On June 2008, the NSW population reached 6.98 million people, an increase of 1.1% from the previous year. NSW's population is predominantly urban, with 63% (4.4 million people) living in the Sydney Statistical Division (SD). A further 20% (1.38 million people) are located in *coastal* Local Government Areas (LGAs), which reflects Australian's preference for living in major urban and coastal areas. By 2036, the NSW population is projected to grow to between 8.6 and 9.7 million. In the same period, the population of Sydney is projected to rise from 4.4 million to between 5.8 and 6.2 million (Australian Bureau of Statistics, 2009).

3.1 Examples of Web 2.0 and Social Media Activity in Australian Local Government

This section provides examples of web 2.0 and social media uses in planning practices on the east coast of Australia. The first example is Facebook being used

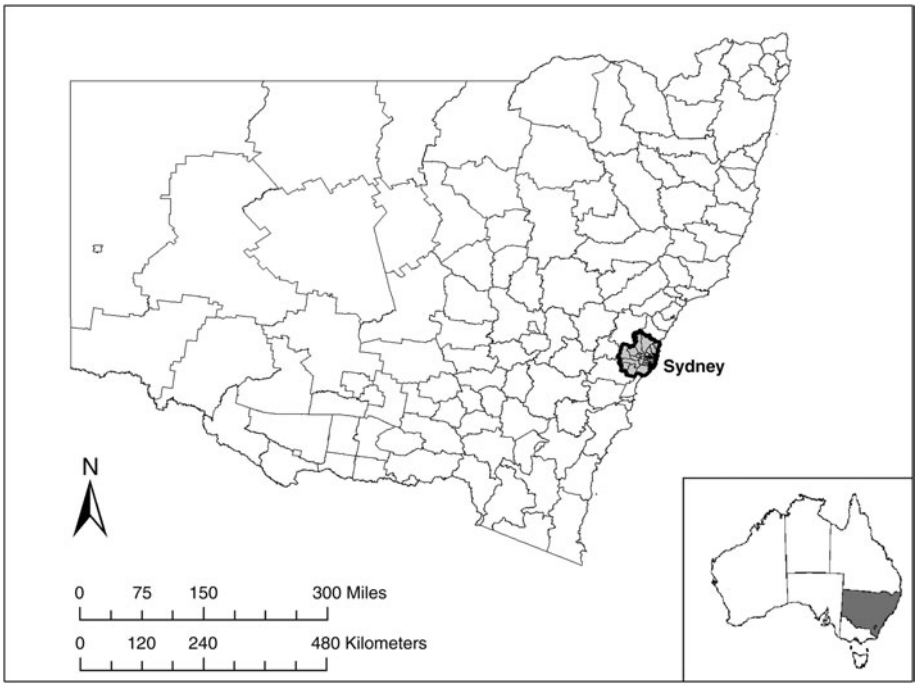

FIGURE 1. Map of NSW LGA boundaries.

as a *citizen-initiated* action group that took place in the industrial city of Newcastle, NSW, Australia. In this instance, Newcastle's central business district (CBD) has been suffering significant retail tenancy and pedestrian traffic issues due to a decline in manufacturing and the rise of suburban shopping malls. To tackle the issues, a citizen created the *Renew Newcastle* action group through Facebook that aimed to revitalize the CBD block by block. The group attracted thousands of followers and has played a significant role in revitalizing the CBD by creating leasing arrangements for small creative projects and start-up enterprises (Judd, 2011). This example also supports the findings of Evans-Cowley (2010) and Foth (2006) that *citizen-initiated* social networks are predominately placed-based planning efforts and are populated by people who live locally.

Another example by Elliott (2011) and the City of Melbourne (2011) was to engage the public consultation process that transformed a *Draft Council Plan 2009–2013* into a Wiki site and allowed local government staff, stakeholders and the general public to edit the wiki pages and/or comment on specific sections of the plan. This example represents a higher level of engagement with the public than traditional public consultancy processes using a wiki interface that is generally understood by the Internet user and is a crowdsourcing method of harvesting collective intellect to provide creative solutions from networks of citizens in a controlled manner that serves local government (Brabham, 2009).

Fredericks and Foth (2012) looked at four case studies of how local government enhances public participation with social media and web 2.0

technologies. There is growing expectation within communities that online participation is provided as part of a variety of participation options (Bittle *et al.*, 2009; Evans-Cowley & Hollander, 2010). Fredericks and Foth (2012) note that a well-managed and funded engagement strategy using social media can help to avoid political backlash and actively involve communities in the planning process by providing complimentary avenues for participation.

Grennan (2011) reports that NSW councils are embracing social media with the aim of extending communications to residents under the age of 40. The traditional methods of consulting via questionnaires and public meetings are effective for reaching older, politically engaged residents, but they are a limited number of people. Grennan (2011) identifies multiple uses of social media including providing information on family-based activities through to information on development activities happening in the local area. Furthermore, Schubert (2012) describes social media as the new door-knock, as politicians seek to get into their communities Facebook feed, Twitter stream or email inbox, especially for time poor people or community members who do not engage with the mainstream media of television and newspapers. This recognizes that within a decade there will be voters who will not be able to remember a time before they could access the Internet, and more specifically, remember a time when they could not access the Internet on their phone. Schubert (2012) refers to recent research that shows that 78% of women with children at home are signed up on Facebook. However, Twitchen and Adams (2012) argue that those in communities who are already politically active will be most likely to meaningfully engage in any online scenarios.

Social media is also being embraced outside of the Sydney metropolitan area. Grennan (2012) reports that communities such as Moore Plains in northwestern NSW are using social media to communicate with a small geographically dispersed population. To promote their online presence, the council created a Facebook avatar that has become the humanizing aspect of their online presence to enable effective communication with the community.

The City of Sydney Council has received over 30,000 visits on a website specifically set up to take comments on decisions before the council (http://www.sydneyyoursay.com.au/). Council has advised that it is now creating 'consulting Apps' for smartphones as the next step in its digital engagement strategy. The number of online visits far exceeds the 50 or so regulars that turn up to council meetings. The City of Sydney is actively trying to engage the young, transient digital citizenry to participate in council decisions. For example, an online forum looking for ideas to promote Sydney's night-time economy collected the idea of mobile food trucks. In response, food trucks have been given exemptions from development consent, and a smartphone application (App) has been developed by council (http://www.sydneyfoodtrucks.com.au/) to provide people with up to the minute locations of food trucks around the CBD (Armitage, 2012). Citizens are also building Apps that share previously unavailable information regarding the consumption of government services (Desouza & Bhagwatwar, 2012).

Armitage (2012) argues that smartphones will become the primary point of contact between government and citizens, meaning that public servants will need to learn a very new set of skills as collaborators, mobilizes and community curators rather than managers in a hierarchical system. Evans-Cowley (2012) also

argues that smartphone usage has the potential to improve productivity, share information and engage with the public. Examples of this can be seen in smartphone Apps that provide land zoning information, public transport locators and timetabling and code violation reporting. Armitage and Wade (2012) consider the use of social media as the beginning of dissolving boundaries in Sydney's social and business infrastructure. For example, public transport may become preferred over personal vehicles, especially by young people who use their travel time to connect with others via social media. Effectively, the smartphone may replace the automobile as a vehicle of freedom.

4. Methodologies

The methodologies for collecting data for this research are threefold: firstly, a website review of NSW local government websites, secondly, an online survey of local government information technology staff and thirdly, Twitter sentiment analysis using freely available sentiment analysis tools. This section outlines each methodology in detail.

4.1 Website Review

Using a similar methodology to that of Evans-Cowley and Conroy (2006), our data collection involved a desktop review of planning documents and planning services functionality that is available on each of NSW's 152 local government websites. The website reviews were conducted in December 2009 to January 2010 and November to December 2012. The reviews used binary coding for documents and services either being available (1) or not available (0). There was no weight given to the look or feel of websites. It was found that all NSW local government authorities have a website. Local government website address details are published by the NSW Division of Local Government and that at least one page is devoted to local planning matters (Department of Local Government, 2010).

To provide equitable scoring of all local government websites, the review used the 20 types of communication, GIS and planning services listed in Table 1.

Following from the research of Evans-Cowley and Conroy (2006), the model developed by McMillan (2002) was used to categorize the various forms of communication via the Internet. Each communication type can be summarized as follows:

Monologue is one-way communication with the receiver, being the public, having no control over the format or type of information provided.

Feedback, the receiver, has some control of the interaction. However, the extent of the communication is not guaranteed.

Response dialogue is two-way communication, and is typically initiated by the public. When a planner responds to the communication it becomes responsive dialogue; however, the planner retains control of the communication.

Mutual discourse is pure two-way communication in which both parties have control of communication and both parties have the opportunity to send and receive messages.

TABLE 1. Communication tools by communication type

Monologue communication	Feedback communications	Responsive dialogue	Mutual discourse
Planning instruments	Customer service email	E-commerce	Discussion forum
Zoning maps	Submit comment to development application online	Lodge development application form online	Blogs
Meeting agenda	Submit comment to plans on exhibition online	Lodge application for planning certificate online	Social media
Meeting minutes		Development application form	
Audio/visual of public meetings		Planning certificate form	
Electronic newsletter			
GIS available			
Planning controls query tool			
Development assessment tracking			

McMillan's model was successfully used in the Evans-Cowley and Conroy (2006) study; therefore, collecting data under the same framework would provide a sound opportunity for a comparison study.

4.2 *Online Questionnaire*

While collecting data during November and December 2012, it became obvious that social media usage was going to be significantly higher than that of 2009. Thus, the following questions arose: how significant was the adoption rate over the three-year period from 2009 to 2012, and has it been higher than the 'dot com' boom of the late 1990s and early 2000s that drove the rapid appearance of websites? To answer these questions, the researcher created a small questionnaire asking councils to provide the *year* that their council implemented a website and social media. The online questionnaire was created in *Survey Monkey* and emailed to Directors or Managers of Information Technology departments at all 152 NSW councils. The email explained the scope of the research and reasons for collecting data about website and social media implementation. Most councils have email contact details available on their website. The sample was also validated using the *WayBack Machine* (http://www.web.archive.org), where available. The questionnaire collected a sample of useable responses from 69 councils (45%); 33 from metropolitan Sydney and 36 from non-metropolitan areas.

4.3 *Twitter Sentiment Analysis*

In order to gain an understanding of how local government is using social media, the researchers also performed sentiment analysis on a randomly selected group of

12 NSW councils, 6 from metropolitan Sydney and 6 from non-metropolitan areas. The only council that was not randomly selected was the City of Sydney, due to their extensive use of social media.

Evans-Cowley and Hollander (2010) found significant challenges for planners attempting to use Facebook, due to its closed network nature. Planners have not created connections with the public in this sense. However, Evans-Cowley and Griffin (2011) identified Twitter as a powerful tool to engage the public. Twitter is an open network where users send 140 character messages, known as tweets. These tweets are shared with others who have signed up to follow that user (Lenhart & Fox, 2008). Furthermore, tweets can be searched by user name prefixed with a @ symbol or hash tag (#). A hash tag is a way of indexing tweets into similar topic groupings. This open style of using Twitter allows planners to read, see or listen to what the community is saying, hence Evans-Cowley and Griffin (2011) see this as an opportunity to engage with the public in a different way. Tweets can be analysed by identifying positive/negative words. Essentially, sentiment analysis is looking for personal positive or negative feelings within the text of a tweet (Go *et al.*, n.d.). Sentiment analysis can be performed manually (Evans-Cowley & Griffin, 2011) or by using analytical tools such as *Twitalizer*, developed by Go *et al.* (n.d.).

For this research, the online sentiment analysis tools of *Sentiment140* (http://www.sentiment140.com) and *Twitalyzer* (http://www.twitalyzer.com) were used to gather sentiment analysis data and Twitter account data on 16 December 2012.

Data were collected from *Twitter* for each of the councils, including *followers*, *following* and *number of tweets* to date. All the councils have less than 2,000 followers, except for the metropolitan councils of Penrith, Pittwater and Sydney, with Sydney having the largest following with just over 17,000 followers. Most councils are following less than 1,000 users, except Penrith and Pittwater, who are following nearly as many users, as follow them. The majority of councils have sent less than 3,000 tweets since their accounts were set up, with the exception of Pittwater, who has sent over 9,000.

The *Sentiment140* tool was used to calculate the positive/negative ratio of each council's Twitter account. This tool looks at the tweets from the past seven days and determines whether there are positive or negative sentiment contained within the tweets. The *Sentiment140* tool only takes a snapshot of recent activity, and does not compile data for the full history of the account. The *Twitalyzer* tool was then used to further investigate the council Twitter accounts. The strength of this tool is that it produces a suite of statistics including the style of Twitter user, *impact* and *klout* statistics, key topics and major influences on the Twitter account. Table 4 contains the statistics generated from *Twitter*, *Sentiment140* and *Twitalyzer*.

5. Results

5.1 Results of Website Review

The communication tools shown in Table 1 were used for the assessment of each LGAs overall performance. The 2009 results were presented and discussed in

Williamson and Parolin (2012). A comparison of data collected in 2009 and 2012 is presented and discussed in the following sections (Table 2).

5.1.1 Monologue. Monologue communications provide planning information directly to the public. The most common forms of monologue communications found on NSW local government websites were static copies of planning instruments, meeting agendas and minutes and electronic newsletters.

For monologue, the communications type with the largest increase was static zoning maps with an increase of 26%. This result was aided by a 32% increase by non-metropolitan councils, and is a direct result of the standard instrument local environmental plan (LEP) and mapping program (Department of Infrastructure, Planning and Natural Resources, 2004). This program has seen all non-metropolitan councils rewriting their principal plans and mapping, the results of which are made available on websites. This program has also seen a slight increase in planning instruments being made available online. Meeting agendas and minutes saw a small increase. The availability of electronic newsletters also slightly increased.

Audio/visual facilities for public meetings were the only communications type to see an overall decrease between 2009 and 2012. Despite the advantages of greater community consultation and engagement, by allowing citizens to view meetings at a time and place of their choosing, there seems to be little interest in local government to progress this service at this time.

GIS increased 16% in metropolitan areas to move their availability to 45%. However, non-metropolitan areas are still lagging, which brings down the overall usage to 26%. Again, the standard instrument LEP and mapping program have probably aided this increase. However, budgetary and technical resource issues may still hinder non-metropolitan councils from introducing GIS to their websites (Williamson & Parolin, 2012).

A small number of metropolitan councils have taken their planning instruments and dissected them into a planning instrument query tool. However, the use of this communications type decreased by 2% between 2009 and 2012. The tool allows a citizen to drill down into the local planning instrument using their address and a proposed type of development. The planning controls query tool that allows the user to choose a specific parcel of land and a development type and receive details of which sections of the planning instruments and associated controls are related to the chosen combination.

Development application tracking usage increased from 83% to 90% of metropolitan councils and from 20% to 31% of non-metropolitan councils between 2009 and 2012. This software allows the public to view the details of current applications lodged with the councils planning department. The usefulness of this service lies in its ability to provide the applications current status to the applicant or other interested parties without having to telephone the relevant councils customer service or planning department to gain this information. The software also provides broad search capabilities and a simple interface for the public to submit comments back to council on a specific development application.

Planning instruments, zoning maps, meeting agendas, minutes, electronic newsletters and development application tracking have all increased usage by

TABLE 2. Availability of interactive tools by type of communication

	Metropolitan			Non-metropolitan			Overall		
	2009	2012	Change	2009	2012	Change	2009	2012	Change
Monologue									
Planning instruments (%)	100	100	0	87	95	8	91	97	6
Static zoning maps (%)	79	90	11	43	75	32	53	79	26
Meeting agenda (%)	98	100	2	87	99	12	90	99	9
Meeting minutes (%)	98	100	2	97	98	1	97	99	2
Audio/visual of public meetings (%)	5	5	0	2	1	−1	3	2	−1
Electronic newsletter (%)	71	86	15	74	80	6	73	81	8
GIS (%)	29	45	16	16	18	2	20	26	6
Planning instruments query tool (%)	21	19	−2	3	6	3	8	10	2
Development application (DA) tracking tool (%)	83	90	7	20	31	11	38	47	9
Feedback									
Customer service email (%)	100	100	0	100	100	0	100	100	0
Submit comments to DA online (%)	83	93	10	23	30	7	39	47	8
DA forms (%)	100	100	0	94	99	5	95	99	4
Submit application for property certificate online (%)	19	48	29	7	8	1	11	19	8
Property certificate form (%)	98	100	2	88	95	7	91	97	6
Submit comment to plan on public exhibition (%)	62	83	21	30	38	8	39	51	12
Responsive dialogue									
E-commerce (%)	100	100	0	55	60	5	68	71	3
Lodge DA form online (%)	17	38	21	4	4	0	7	13	6
Mutual discourse									
Discussion forum (%)	12	33	21	4	2	−2	6	11	5
Blogs (%)	5	5	0	0	0	0	2	2	0
Social media (%)	21	67	46	4	49	45	9	54	45

councils across the state of NSW. However, the implementation rate of audio/visual recordings of public meetings actually decreased and planning instrument query tools decreased in metropolitan areas. As Evans-Cowley and Conroy (2006, 2009) concluded, most forms of monologue communications are relatively easy and inexpensive to provide. However, the reasons why councils are reluctant to provide the slightly more complicated forms of communication remain a topic of future research. Possible barriers may include no perceived need by the council management, especially in non-metropolitan areas with low volumes of development proposals and a reluctance to engage in the ongoing costs for the administration and maintenance of these communication tools in areas where information technology personnel are not readily available (Stenning and Associates, 2004; Yigitcanlar, 2005).

5.1.2 Feedback. Feedback communications provide the public with the opportunity to offer feedback or input into the planning process (Evans-Cowley & Conroy, 2006). The community has some control in feedback communications, but it is not guaranteed. Overall, more than 95% of metropolitan and non-metropolitan councils have email contact, development application and planning certificate forms available on their websites. The availability of development application and property certificate forms in pdf format has continued to increase to 98%. Submitting comments to development applications and plans on exhibition have also increased substantially overall to 47% and 51%, respectively. Submitting an application for a property certificate online saw a 29% increase in metropolitan areas. These results demonstrate that councils are pursuing the more complicated communication channels.

Studies by Stern *et al*. (2009) demonstrate that web participation differs according to age groups and education background, while finding that citizens are empowered by the opportunity to use both traditional and web-based participation tools, although web-based participation is not yet a replacement for traditional participation. Similarly, Evans-Cowley and Conroy's (2006) survey of U.S. planners found that online participation is supplementary to traditional process, and also some evidence that participation tools are not reaching the broader population, especially underserved or disenfranchized sections of the population.

5.1.3 Responsive dialogue. Responsive dialogue communications offer the public a greater degree of interaction with the planning process. Responsive dialogue is demonstrated by planning in the form of applications and e-commerce. The main applications used by local government planning in NSW are development applications and planning certificates. There are a large number of different development applications, but they can be collectively referred to as applications, as they are all lodged in a similar process. A planning certificate contains information for a specified parcel of land, including zoning and any State or local plans and restrictions that may apply. Planning certificates are legal documents used in the conveyance process, and are commonly considered a source of truth for planning information.

The lodgement of electronic development applications online has increased from 17% to 38% in metropolitan areas and has stabilized at 4% in non-metropolitan

areas. As observed by Evans-Cowley and Conroy (2006, 2009), providing downloadable application forms is considered monologue communication when the form is not submitted online; hence, the responsive dialogue mode of using electronic lodgement is underutilized and there is little explanation about why this attitude persists. However, the 2012 data demonstrate that councils in metropolitan areas are actively pursuing the more complicated responsive dialogue communication channel.

The NSW planning system is promoting and councils are increasingly utilizing pre-lodgement meetings and final checks of development applications before accepting for lodgement (Department of Planning, 2009). This final checking helps the council avoid complications and loss of time due to incomplete applications in a planning system that places strict time limits on the determination of development applications. Similarly, planning certificate applications take time to be processed and are typically manually checked by planning staff before being issued, due to low confidence in data accuracy (Hornery, 2008). However, significant increases in the use of development application and property certificate lodgement online between 2009 and 2012 suggest that councils continue to improve internal workflows and data accuracy to allow the use of these communication channels.

5.1.4 Mutual discourse. Mutual discourse communications provide the public with the opportunity to engage in extended communications with the planning process. Walsh (2009) explains that moderated blogs and forums offer a chance to post an issue and get a quick response from the community in an environment where all voices are heard equally. Examples of mutual discourse are forums, blogs and a number of social media tools, such as Facebook and Twitter, which have emerged in more recent times.

In 2009, 12% of metropolitan and 4% of non-metropolitan councils hosted discussion forums on local planning issues, while 5% of metropolitan councils hosted blogs on local planning issues. By 2012, metropolitan councils have increased discussion forum usage by 21%, while non-metropolitan councils decreased by 2%.

The 2009 data highlighted that a number of councils were using *Bang the Table* (Bang The Table, 2010). This independently hosted and moderated service provides an online discussion forum that is easy for councils to set up and requires little modification of their website. A search of the *Bang the Table* website found hundreds of forums belonging to NSW councils, with several councils having multiple forums. *Bang the Table* continues its strong use by NSW councils, with more councils now placing links to forums on their own website. In the same time period, Blogs held steady at 5% in metropolitan areas and 0 in non-metropolitan areas.

In 2009, the use of social media tools such as Facebook and Twitter was observed on 21% of metropolitan council and 4% of non-metropolitan council websites. Social media tools offer an opportunity for planners to engage with the community without major modification or maintenance to their existing websites. Evans-Cowley and Conroy (2009) also found that the uptake of social media has surpassed the use of discussion forums. In 2012, data collection has revealed a 45% increase in metropolitan areas. Furthermore, a 46% increase was observed in

non-metropolitan areas. This was the largest increase of all communication channels, and also the only communication type to significantly increase across the entire state.

The breakdown of social media types is shown in Table 3. Fifty-one per cent of councils displayed links to Facebook, while 38% displayed a link to Twitter. These two forms of social media far exceeded the use of several of other forms of social media. These data concur with Cowling (2012) who lists Facebook, with 11.8 million active users, as Australia's most popular social media channel. This is followed by YouTube, Blogspot, Tumblr and WordPress. As at December 2012, Twitter is listed seventh with 2.1 million active users.

5.2 *Results of Questionnaire*

The questionnaire collected a sample of useable responses from 69 councils (45%); 33 from metropolitan Sydney and 36 from non-metropolitan areas. The results of the questionnaire for web-site and social media adoption are presented in Figure 2.

The result of this questionnaire reveals that website adoption by NSW councils had early adopters between 1992 and 1994. The adoption rate then increased from 1996 culminating in its highest adoption rate in the year 2000, followed by a tapering off between 2001 and 2004. Social media had early adopters in 2006 and then sustained adoption at significant rates between 2009 and 2012. It could be argued that social media uptake is more rapid than that for websites a decade earlier. However, it must be noted that websites required the expense of installation of computer hardware and network links in order to implement a website, whereas social media is free to set up and the placement of links on a website to the centrally hosted services is relatively simple. Nevertheless, councils still have to make the decision to start using social media, develop a social media usage policy and then assign the day-to-day operation of social media accounts to council staff.

5.3 *Results of Twitter Sentiment Analysis*

In order to gain an understanding of why local government is taking up social media, the researchers then performed sentiment analysis on a randomly selected

TABLE 3. Social media usage by type

	2012
Facebook	51%
Twitter	38%
Youtube	9%
Google +	4%
Pinterest	2%
Flickr	4%
Linked In	3%

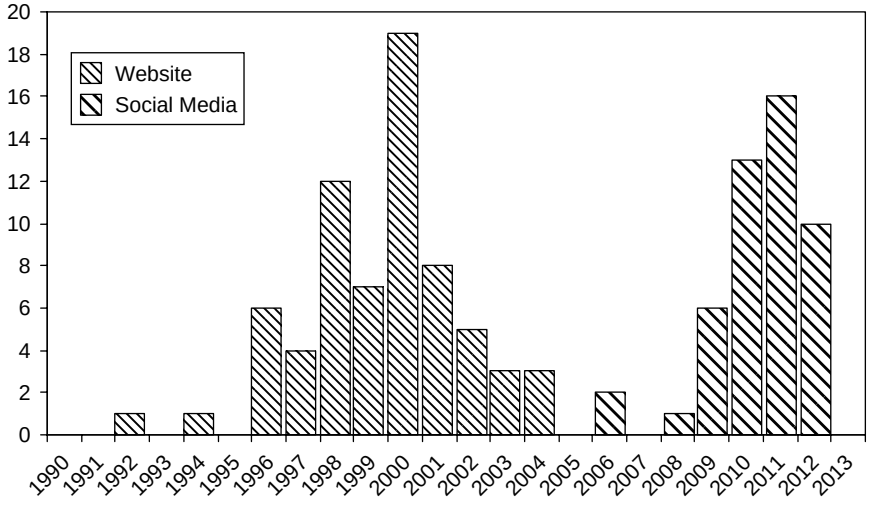

FIGURE 2. Website and social media adoption rates by year.

group of 12 NSW councils, 6 from metropolitan Sydney and 6 from non-metropolitan areas. The only council that was not randomly selected was the City of Sydney, due to their extensive use of social media.

Table 4 shows that most councils have a positive ratio, with less than 3 or 4 negative tweets—although Penrith Council had a relatively high number of negative tweets associated with their account. Most councils were labelled *casual user*, except Sydney who was labelled *reporter*, which is in recognition of the higher following and impact scores.

Twitalyzer also generates your *impact score* by taking into account the following factors: number of followers, unique references and citations, frequency of being retweeted, frequency of retweeting and frequency of tweeting (Twitalyzer, 2012). Most councils were given very low *impact* scores, except City of Sydney who scored 4.3 out of 10. *klout* scores which are generated by taking Twitter activity including retweets, mentions in other people's tweets, list membership, number of followers and replies (Klout, 2013). In line with *impact*, most councils were given low *klout* scores, except City of Sydney who was given a *klout* score of 61 out of 100.

The topics listed for each council are dominated by *government*. Other common topics for local government in Australia were also identified, including community, dogs, art, media, entertainment, environment and business. These topics demonstrate that the Twitter accounts of this sample of local government agencies are being used for a wide range of local community topics such as community events, dogs on leashes and entertainment. Notably, there is little indication that urban planning is a topic, except for the City of Sydney account which listed urban renewal. Considering that the council covers several inner city suburbs that have been going through waves of gentrification over the past two decades, this seems appropriate.

TABLE 4. Twitter sentiment analysis

Council name and @ tag	Type	Pop.	Followers [a]	Following [a]	No. of Tweets[a]	Positive/ negative ratio[b]	Style[c]	Impact [c]	Klout [c]	Topics[c]
Albury, @AlburyCity	Non-metro	51,112	1,386	870	896	10/3	Casual user	0.4	46	Australian government
City of Sydney, @CityofSydney	Metro	182,226	17,277	355	1,748	31/4	Reporter	4.3	61	Australian government, dogs, community, urban renewal, Sydney
Dubbo, @DubboCouncil	Non-metro	41,763	509	176	720	1/0	Casual user	0.1	44	Art, media & entertainment, business & finance, environment, news & society
Manly, @Manly_Council	Metro	41,925	1,591	435	2,882	No result	Casual user	0.3	42	Australian government
Moree Plains, @MoreeShire	Non-metro	14,425	19	2	487	No result	Casual user	0	0	No results
Mosman, @MosmanCouncil	Metro	29,232	2,256	898	2,602	2/0	Casual user	0.5	46	Australian government
Narromine, @Narromine	Non-metro	6,841	354	58	512	4/1	Casual user	0.2	37	Government
Penrith, @penrithcouncil	Metro	186,221	2,430	2,397	1,304	35/16	Casual user	0.5	46	Art, media & entertainment, environment, Facebook, news & society, social issues
Pittwater, @aboutPittwater	Metro	59,847	2,321	2,078	9,345	5/1	Casual user	0.6	49	Australian government, Internet & web, social media
Shoalhaven, @ShoalhavenCC	Non-metro	96,967	557	648	405	3/0	Casual user	0.1	43	Business & Finance, environment, news & society, social issues
The Hills, @TheHillsCouncil	Metro	197,716	1,701	572	1,748	4/1	Casual user	0.4	45	Apps
Wagga, @wwccmedia	Non-metro	63,500	663	66	992	5/1	Casual user	0.2	45	Canberra

Statistics sourced from: [a]Twitter, [b]Sentiment140 and [c]Twitalyzer.

6. Discussion

Trenkner (2009) asks questions of social media for government participation regarding who owns the content, the implications of advertisements appearing in government-initiated social media and how to handle abusive comments? For NSW, local government has developed social media policies and strategies that provide objectives and rules for social media use. The objective is to provide an internal voice to promote corporate messages in a marketing or promotional style and to disseminate time sensitive information to the widest possible audience. The guidelines are clear to staff about the separation of personal and business lives. It is also clear that staff may only share publically available information and follow approval processes, in the same manner as publishing other documents. Furthermore, communications must be archived as formal records. Staff must also monitor social media channels and be aware of current discussions (Bankstown, 2010; Kempsey, 2011). Staff are not to reply to comments that criticize council policies or practices. All content is to be recorded with Author name, date, time and media site location. Policies also explain the need to minimize miscommunication and mischievous communications (Christensen, 2011). Trenkner (2009) concludes that government will always face an element of risk when using social media. An appropriate analogy is that of a citizen approaching the microphone at a town hall meeting, nobody really has control of what they might say. As social media becomes more entwined in society, governments will embrace and use social media to engage society.

The potential impact of social media on community participation is the ability for anyone to potentially be heard by a wide audience, therefore providing a relatively equal opportunity for citizens to be heard (Kushin & Kitchener, 2009; Conroy *et al.*, 2012). This sentiment analysis sample shows that NSW local government is predominantly casual users of their Twitter accounts, which are used to share basic information on typical local government topics. There is little evidence of these Twitter accounts being used to create *mutual discourse* communications; rather, the mode is *monologue*. Conroy *et al.* (2012) found that social media such as Facebook can increase the levels of political participation; however, a similar effect on the levels of political knowledge is not assured. Analysis of user-generated content suggests that the quality of information is generally lacking, is incoherent or overly opinionated. Effectively, social media users are not exposed to new or well-articulated information about issues, but given information in a mode of reinforcement. It will take some time for the impact of social media tools such as Twitter to be clearly measurable and evolve into a more authentic mutually dialogue mode. However, the City of Sydney Council is actively pursuing an online community participation strategy and seems to be producing notable results.

Evans-Cowley and Griffin (2011) found that social media can collect more information about what the community was saying than through traditional forums; however, the transport planning agency struggled to effectively use this information. It realized that significant resources were needed to support analysis work that was not feasible. The decision-makers were asking for an understanding of the story behind the data. From this sample of social media usage, there is little

evidence that social media channels are being used by planning departments within NSW local government. Although it is relatively simple to sign up and use social media, the organizational use of social media is more complicated and requires users to adhere to authorizations and existing records management procedures. This may take some time to become fully embedded in government organizational procedures.

The implications of using social media in planning practice to deliver information and services to facilitate planning processes, and therefore increase community understanding of planning, may be in its early stages of implementation. However, there are growing expectations within communities that online participation is provided as part of a variety of participation options (Bittle *et al.*, 2009; Evans-Cowley & Hollander, 2010). Through detailed interviews with local government staff, Fredericks and Foth (2012) found that a well-managed and funded engagement strategy using social media can help to avoid political backlash and actively involve communities in the planning process by providing complimentary avenues for participation.

7. Conclusion

By seeking links between *deliberative* (Forster, 1999) and *consensus building* (Innes, 1996) concepts of planning theory to the emerging use of online communications, this paper has presented a longitudinal comparison for which the findings for the most part concur with the U.S.-based studies conducted by Evans-Cowley and Conroy (2006, 2009). The results of all studies demonstrate that local government is familiar with *monologue* communication; however, the implementation level of more interactive tools that act in *feedback*, *responsive dialogue* and *mutual discourse* communication modes remains lower. While social media promises to expand the communication choices of both local government and the community by creating a channel for authentic dialogue, there is little evidence of social media being used to create *mutual discourse* communication; rather, the mode continues to be *monologue*.

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