Digital Networks in Public Administration: The Case of #Localgov

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Abstract. Digital networking has been shaping interactions between governments and their respective publics over the last years. At the same time, networking spaces have become hosts to informal communities of public sector professionals engaging in discussions that remain largely unexplored. This papers looks at the dynamics of interaction between public sector professionals in digital networking spaces using a dataset of tweets that contain the hashtag #localgov. This hashtag is used by a variety of accounts mainly within the UK local government. An analysis of 235,681 tweets posted during 2013–2015 shows how #localgov facilitates interactions and the sharing of expertise within the context of intense financial cuts imposed by the UK government. We discuss how networking spaces like #localgov support open discourses as part a network of practice outside organisational barriers.

Keywords: Social media · Digital networks · Networks of practice · Budget cuts · Local government finance

1 Introduction

The study of networks and networking relationships has been popular in public administration research e.g. [1– 3]. Public sector networks generally include policy, collaborative and governance networks which vary in their aims but all entail interactions within or across government agencies and other actors like interest groups, businesses, professional associations and non-profits. More recently, there is increased interest in networks that emerge in more informal settings and enable individuals to share expertise according to their interests [4–6].

Many of these networks are emerging in social networking spaces where public sector professionals share insight about their work, connect to colleagues and even collectively discuss policy issues. Such communities include permanent (e.g. blogs, LinkedIn groups) or more ad hoc spaces (e.g. Twitter) that facilitate personal networking outside organisational boundaries [7]. It is often the case that informal networks on social media reflect trends and processes of institutional change in government agencies [8]. So far, research on social media in the public sector has focused on adoption practices

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within government agencies or explored the impact on citizen-government relationships e.g. [8–11]. Beyond communications with the public, there still more to learn about social media within the public sector. As part of this, it is important to explore the new dynamics of interaction between public sector professionals in digital networking spaces.

This paper presents an analysis of the #localgov Twitter hashtag that is mainly used within the UK local government. A dataset captured within a period of almost two years (June 2013 to May 2015) includes 235,681 tweets posted by 37,592 users. This retrospective mapping of online interactions takes place within a period of extended change caused by the UK government's financial decisions that led to significant reductions in local government budgets. Specifically, the dataset tracks reactions to budget reductions from the Spending Review announcement in June 2013 by the Chancellor of the Exchequer (Finance Minister) to the Queen's speech that identified key priorities for the newly elected government in May 2015.

The analysis shows a wide variety of exchanges amongst local government actors about the impact of the cuts and appropriate responses by local government (e.g. joining-up services). Conversations were found to be mainly driven by the need to localise the centrally imposed agenda of budget reductions. This suggests that informal networks like #localgov can facilitate the sharing of expertise even if there is no evidence that they directly drive institutional change. We briefly discuss the implications of these findings including the methodological ones.

2 Digital Networks of Practice in Public Administration

Networks in public administration mostly involve formal organisational structures classified as policy, collaboration or governance networks [1, 4, 12]. Studies of digitally-enabled networks have also remained within the context of interorganisational collaborations. Janowski et al. [13] introduce Government Information Networks where actors use ICTs to connect to others and build, manage or sustain relationships. Dawes et al. [14] describe Public Sector Knowledge Networks as sociotechnical systems that facilitate interorganisational knowledge learning in tackling complex public management problems. Both these concepts refer to organisational networks where interpersonal relationships are embedded within clearly defined professional tasks (e.g. emergency management or service delivery).

In this paper, we turn our attention to digital networks that enable individual connections on the basis of their professional identity. An established concept to describe informal interpersonal networks can be found in "networks of practice", which are spaces of collective learning that involve interactions between participants within professional practice [15]. Networks of practice are driven by individuals based on a loose professional identity to facilitate knowledge exchange across organisations without relying on existing relationships. Within public administration, such structures have emerged in contexts like forensic scientists in government crime laboratories [5] and advice networks between school teachers [6]. Both Binz-Scharf et al. [5] and Siciliano [6] conclude that informal networks deserve attention because they

can have largely positive effects in public organisations – not only they facilitate knowledge sharing amongst highly-skilled professionals but also allow crossing organisational barriers in ways that have otherwise not been possible.

When considering digital networking relationships, a highly relevant stream of work can be found in digital or electronic networks of practice [16–19]. Digital networks of practice are generally open, self-organised and without formal controls [16, 17]. They allow individuals interact with others to exchange advice and ideas with others based on common interests related to their practice. Public or semi-public spaces like forums, knowledge portals, intranets and social networking groups are common spaces where such networks emerge. Participants tend to contribute when they think that it enhances their professional reputation, when they have something important to share and when they feel a structural part of the network – expectations of reciprocity from other participants may not even be necessary [18]. As a result, digital networks of practice have been found to facilitate connections between regional networks in traditionally fragmented areas of professional practice like agriculture [20].

These features suggest that digital networks of practice can facilitate the formation of relationships between individuals within but also across the strict boundaries of professional practice within the public sector (e.g. forensic scientists, school teachers). As such, these spaces can arguably facilitate the transfer of knowledge through network relationships across institutions [21, 22]. For example, Mergel and Bretschneider [8] discuss how the adoption of social media applications is often the result of informal exchanges across agencies where challenges are discussed collectively (e.g. good practice, challenges, resource implications). In this respect, digital networks can drive forthcoming trends in the public sector due to knowledge sharing across institutional barriers. As a result, it is important to look further into the dynamics of interaction between public sector professionals in these spaces.

3 Study Methodology

User-generated content from social media applications can be an important source of data e.g. [23]. Twitter hashtags usually form on a dynamic basis around events like national elections, emergencies or popular television shows [24]. Hashtags were initially self-assigned by Twitter users but soon became a key element of Twitter's unique proposition as an immediate information sharing platform. In professional networking, hashtags can facilitate rapid information sharing and links to resources than the exchange of in-depth opinions within long conversations. This feature makes Twitter hashtags different than social networking groups were membership is stable and clearly defined.

The Twitter hashtag #localgov provides an interesting context to study the role of informal networks particularly during the period 2013-2015. #Localgov is the most popular Twitter space used by professionals involved in different aspects of local government in the UK (e.g. policy actors, officers, elected representatives, service providers, consultants and journalists). The use of #localgov is not exclusive to the UK local government but an estimated 70–80 % of the tweets that use the hashtag are related to this context. This was also confirmed by our data analysis.

Twitter posts tagged with #localgov were collected from June 2013 to May 2015 using Chorus Analytics, which is a set of applications designed to facilitate social science research [25]. Chorus captures data from Twitter's application programming interface that is publicly available to developers. Keyword-based searches can retrieve tweets posted up to a week before each search. To update the database of tweets from #localgov, searches took place automatically and on a daily basis during the period of study within 2013–2015.

Following a data cleaning and validation step, the final dataset contained a total of 235,681 tweets posted by 37,592 unique accounts. This dataset includes all original tweets and retweets that were posted in this period and contained '#localgov' within their text. The analysis was carried out in several steps. For the analysis reported in the paper we focus on the following:

- *Overview of #localgov activity:* mapping the volume of tweets over time in relation to their structure (e.g. mentions, retweets, hashtags) and content (main topics of discussion). The latter involved keyword frequency queries using the qualitative analysis software NVivo 11. To facilitate the analysis, the dataset was divided into four roughly equal parts based on a 6-month interval within the near two years of data collection.
- *Social networking analysis:* to extract and visualise networking relationships between user accounts within the dataset in the form of mentions or retweets. The open source tool Gephi was used to visualise networking relationships.

4 Findings

About 2.2 million people are employed by local government authorities in the UK [26]. The institutional structure of local government is diverse with different administrative authorities having responsibilities related to transportation, planning, social care, housing and waste management – the main entities are known as councils. Councils are strongly reliant upon central government funding at the levels of 70 % on average [27]. As a result, budget decisions at the UK central government level have a strong impact on the financial position of local authorities. Because of this reliance, it is not surprisingly that relationships between central and local government actors have been traditionally tense.

The 2008 financial crisis and its consequences on the wider economy have put significant pressure on UK public finances. In the period 2010–2015, local government expenditure experienced unprecedented budget cuts under the Conservative-Liberal Democrat coalition government. Real local government expenditure was reduced by an estimated 40 % in real terms over this period [28]. Related to the timeframe of the tweets collected, the central level budget events during the parliamentary year 2013–14 resulted in significant reactions from local government, particularly in June 2013 when further cuts were proposed in an official Spending Review announcement by the Chancellor of the Exchequer (Finance Minister). This was the starting point of our data collection. The end point is May 2015 after the national elections with the Queen's speech that set areas

of priority for the newly elected government. This is the context within which our Twitter data can reveal how #localgov acts as an information sharing and discussion space.

4.1 Overview of #Localgov

Table 1 shows the overview of of tweets tagged with #localgov. The 235,681 tweets correspond to approximately 331 tweets per day – a daily posting frequency that kept increasing during the period of capturing. The volume of tweets tagged with #localgov peaks during weekdays at the levels of 400–500 tweets while weekends generate fewer tweets at the levels of 100. Daily peaks of activity were related to a combination of events like the joint local government and European elections on 22/5/2014 (986 tweets), other elections, political events, adverse weather conditions and financial announcements. For example, the Spending Review announcement on 26/6/2013 with 1,178 tweets sparked a plethora of predictions, previews of key points commentaries, official responses and other reactions.

Table 1. Overview of #localgov activity

Period	Total tweets	Tweets per day	Retweets	Direct Mentions	Tweets with links	Accounts
20/06/2013 to 31/12/2013	56,762	291	23,154 (40.8 %)	4,067 (7.2 %)	37,567 (66.1 %)	11,142
01/01/2014 to 30/06/2014	58,085	321	24,722 (42.6 %)	4,459 (7.7 %)	42,062 (72.4 %)	11,826
01/07/2014 to 31/12/2014	63,335	344	29,949 (47.3 %)	4,235 (6.7 %)	45,150 (71.3 %)	13,731
01/01/2015 to 31/05/2015	57,499	381	28,558 (49.6 %)	3,650 (6.3 %)	42,617 (74.1 %)	14,408
Total	235,681	331	106,383 (45.1 %)	16,411 (7 %)	167,396 (71 %)	37,592 (unique)

As shown in Table 1, an increasing proportion of tweets over time, around 65–75 %, contain links to resources in the form of commentaries, news websites, blogs or other sources. The accompanying tweets can be simply informational, ironical, critical or political. There is also a steady increase in the proportion of retweets during the time of study from about 41 % to almost 50 %, which to some extent accounts for the increased number of users contributing to the hashtag. The proportion of direct mentions to other users fluctuated around 7 % and slightly decreased mainly in the last period – this is not unexpected in the months before the UK elections of May 2015.

We can also observe a steady increase in the number of accounts contributing in each period up to a total of 37,592 unique contributors. This might reflect three different trends: (1) increasing interest in the hashtag itself (network effects), (2) the growing base of Twitter users in the UK and (3) increasing use of Twitter for professional networking amongst different groups related to local government.

In terms of content, taking into account only original tweets (no retweets), contributions to #localgov focused heavily on topical and temporal keywords. Keywords like “council”, “local”, “new”, “government”, “public”, “services”, “social”, “city” and “today” were mentioned at least 2,000 or more times. This was followed by similar

themes containing “people”, “committee”, “meeting”, “report”, “digital” and “future” that received over 1,000 mentions. These more general themes were followed by terms more specific to local government finances including “cuts”, “care”, “communities”, “funding”, “sector”, “elections”, “finance”, “tax”, “leaders”, “budgets”, “labour” and “housing” all of which were mentioned at least 500 times.

Taking retweets into account, as expected, themes that are more nationally relevant receive more attention via reposting. For example, “cut” and “cuts” receive over 10,000 mentions combined. The overall conclusion from the keyword analysis is that, except general keywords that every council or local government officer could use, the dominant theme of discussion was centred around financial cuts and their impact. Although this conclusion can be expected, it is interesting to see how discussions took place as a conversational network of mentions between users.

4.2 Networks Within #Localgov

Networking relationships of accounts that contribute to #localgov can be visualised as a map of interactions in the form of mentions or retweets. Extracting this information from the 235,681 tweets led to a network that has 15,014 nodes (different accounts) and 38,509 edges (mentions or retweets). This network is very diverse in its composition

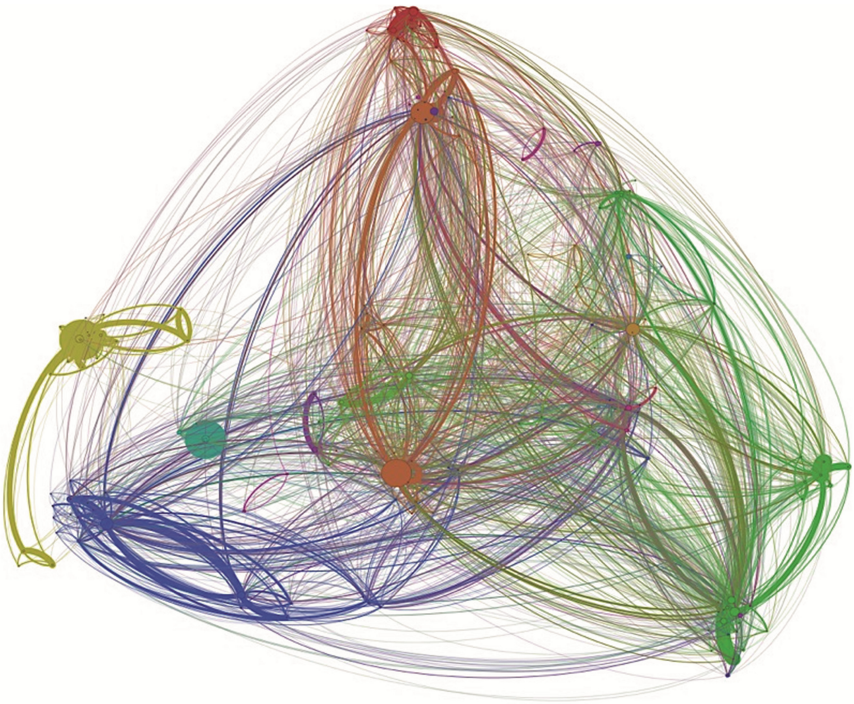

Fig. 1. Network of accounts that received at least 10 mentions or retweets during the whole period.

and contains hundreds of different communities or clusters. Such diversity is expected in a hashtag as broad as #localgov over two years. It is interesting to observe how interactions between accounts that contribute to #localgov represent certain groups within this open network and how they reflect specific conversations during the period of study. Given the complexity of such a task, we show here one example of networking analysis.

Figure 1 represents a network of accounts that received and made at least 10 mentions or retweets. This most interactive core of the network contains 176 nodes (1.17 % of the total) and 2,886 edges (7.49 % of the total). The different colours are indicative of the main clusters that exist within this network. The yellow, slightly disconnected cluster represents accounts outside the UK like @icma, the @theCPBB and @careersingov. The blue cluster represents main media accounts that receive high number of references in informational tweets like popular UK media accounts (e.g. @Guardian_Local and @GdnLocalLeaders). The green and red clusters represent frequent interactions between a large group of influencers in the local government community including think tanks, the Local Government Association, magazine editors and other leaders that receive a lot attention.

Furthermore, it is important to note that central government and other political actors have an "implied" but not active presence in these networks; for example, the account of Eric Pickles (former secretary for the Department of Communities and Local Government) received over 200 mentions but made fewer than 5.

5 Concluding Remarks

The dynamics of interaction in #localgov reveal the existence of an open community that reflects many of the characteristics of professional networking (e.g. decreased activity over weekends). Conversations within #localgov are driven by both endogenous (what happens in local authorities) and exogenous sources (central government financial measures). Many of the posts are purely informational (e.g. retweeting news items), but we also find a large amount of direct interactions and exchange of opinions. Existing local government networks and organisations, civil society actors, news and media accounts act as main hubs in different topics but discussions are not highly centralised around a few key contributors. This is not unexpected given that local government is a large tier of administration that brings together sub-communities around common professional interests (e.g. care services, local development, financial planning).

This open, dynamic and highly flexible nature makes #localgov much different from networks that exist within formal organisational and institutional structures [13, 14]. At the same time, the extent to which contributors experience #localgov as a network of practice certainly fluctuates. Twitter hashtags remain unexplored in this context but literature within networks of practice indicates that members have can varying levels of participation, unclear membership and strong motivations to increase their reputation [16–19]. In #localgov, levels of participation change depending on the topic, for example, in themes like budget reductions activity peaked when there was high interest to discuss the impact of the cuts. Reliance on existing relationships is minimal although it is likely that conversations tagged with #localgov are also determined by "following"

relationships or result in new connections between users. While conversations and relationship formation takes place in a very open way, #localgov still exhibits some boundaries. Central policy actors are mentioned in the network but do not engage in discussions, which reflects the traditional setting of intergovernmental relationships especially in England.

The contribution of this study lies in improving our understanding of how networking relationships in the public sector are moving on digital spaces where new types of interactions are being enabled. In particular, open networks like Twitter allow both collective discourses to take place and the ad hoc formation of ties between participants. For public managers, it is important to be aware of how digital networking relationships affect knowledge sharing across public organisations and tiers of government. At the next level, they might need to consider facilitating those relationships with or without claiming institutional ownership. For example, the way the central-local government duality was reflected in our networking analysis is an interesting starting point.

Methodologically, the study applies emerging digital research methods to new phenomena that have gradually gained importance. Understanding the evolution of digital discussions is challenging due to the novelty of the phenomena and the exploratory nature of the analysis. As a result, the study has limitations inherent to most digital research methods where inferences are attempted between online and offline activity. Information flows in a popular hashtag like #localgov are driven by a large number of events that might be difficult to understand using summary measures like keyword analysis and network visualisation. The choice of #localgov, motivated by intense discourses over local government finances during the study, increases the complexity of analysis compared to more contained hashtags.

Finally, as a self-assigned hashtag, #localgov might not even include all relevant tweets and is certainly an intentional tagging method for users that want to increase the reach of their tweets. We cannot know what motivated each individual user to assign #localgov to their tweets and the extent to which they monitor other discussions within the hashtag. These issues have to be taken into account in more in-depth interpretations of findings while further work is needed to map and understand digital interactions in social networking spaces.

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