Communication Roles in Public Events

Milad Mirbabaie, Christian Ehnis, Stefan Stieglitz, Deborah Bunker

Communication Roles in Public Events –
A Case Study on Twitter Communication

Milad Mirbabaie[1], Christian Ehnis[2], Stefan Stieglitz[1], and Deborah Bunker[2]

[1]University of Muenster, Muenster, Germany
{milad.mirbabaie, stefan.stieglitz}@uni-muenster.de
[2]University of Sydney, Sydney, Australia
{christian.ehnis, deborah.bunker}@sydney.edu.au

Abstract. Whilst many studies have looked at the characteristics of effective communications via social media platforms, their use during public events for people to communicate and organize is still relatively uncharted. We have even less understanding of the roles that public event participants play in their use of social media, and this study seeks to address this gap in our knowledge. We analyse the Twitter data related to the 1st May 2014 event (Labour Day) in Germany to identify participant roles in this event, and the impact their tweets had on other participants. From this analysis we draw some tentative conclusions about participant roles in public events and their impact and highlight areas for further investigation.

Keywords: social media analytics · Twitter · public events · emergency service agencies (ESA) · social network analysis

1   Introduction

There is no doubt that social media has been adopted by many people in order to exchange information that is both timely and topical. The mass usage of social media is of course underpinned by the low transaction cost for the sharing of information (i.e. ubiquitous access, negligible monetary costs of devices and telecommunications, low time investment). The emerging and swift diffusion of mobile devices, such as smartphones, further lower these costs and lead to increasing rates of ad-hoc information being shared [1].

As a result social media is having an increasing impact on communication during public or extreme events. Examples of such events could be public holiday celebrations, public disturbances and demonstrations, or large public crowd incidents such as the Boston Marathon bombings in 2013 [2]. Witnesses to a public event often share text based information or use their smart phones to share photos within seconds of an incident occurring. From our current understanding of social media use for personal communication we know that social media are not a one-directional information channel. Increasingly, social media communication has a material effect on unfolding events, and for better or worse this has an impact on the management of, and response to an

event. In this sense, social media increasingly becomes an additional source of information that must exist beside traditional "command and control" systems.

It is now becoming critical to understand underlying principles and knowledge about social media communications and how these impact and affect the participation in and management of public events. Until now, there has been very little research conducted to better understand the role of event participants when they communicate via social media i.e. it is unclear if social media communications by individual event participants have differing levels of influence or impact on other individual event participants. To this end, our study analyses the "1st of May" public event (German Labour Day 2014) Twitter data to identify participants and the roles that they played in the event via social media. We decided to analyse this public event, because it has characteristic of an extreme event, but is predictable in its unfolding through experience from previous years. The paper proceeds as follows: Section 2 outlines related work in the field. Section 3 describes the 1st of May case; Section 4 explains our research design; we then present our analysis in section 5 and our findings in Section 6. The paper ends in Section 7 with conclusions and an outlook for further work in the area.

2 Using Social Media to Communicate During Extreme Events

We are observing an emerging trend for individuals and groups to use social media to communicate during extreme events and crises [3]. Social networking platforms (Facebook and Twitter), mapping (Ushahidi and Google) and wiki and mash-up technologies; have enabled one-to-one, one-to-many and many-to-many communications frequently resulting in collaborations. For example we have seen the adoption and use of these platforms and technologies by NGOs, for eco-collaboration activities [4]. These collaboration technologies were used in a structurally dynamic manner depending on the NGO national context (Thai, Lebanese and Australian). We have also witnessed individuals and groups using social media platforms during the civil uprising of the "Arab Spring" i.e., Tunisia 2010/11 and Egypt 2011 [5] and the current uprising in the Ukraine and Crimea 2014.

As a result, traditional centralized "command and control" systems, used by government agencies during events, crises and disasters, must now deal with, make sense of and utilize the proliferation of information generated by organizations, groups and individuals on open and freely available communication and collaboration platforms. Indeed, in order to ensure successful event, crisis and disaster management outcomes, it is imperative that non-agency organizations, groups and individuals constantly provide accurate and reliable information to government agencies, and receive accurate and reliable information from these agencies in return [6]. For example, during the 2011 Queensland Floods [7], there were reports of the difficulties of government agencies in communicating with and engaging local communities to firstly obtain and then incorporate local knowledge on floods, into emergency agency decisions. This may have contributed to higher than necessary the loss of life and property for some communities [8].

The case of the formation and role of the Student Volunteer Army (SVA) during the Christchurch Earthquakes (2010/2011), is one of many cases that motivate us to examine how to best encourage effective communications between government agencies, organizations, communities, groups and individuals during an extreme event [9]. In the case of the SVA we see the development of situational awareness, utilization of resources and optimization of crisis management outcomes through the inter-play of communications via social media platforms and the subsequent input of the resulting information input into proprietary (and closed) government systems. The SVA was formed by the use of social media in the wake of the Christchurch earthquakes (September 2010 to June 2011). Bunker et al. [9] studied and analysed the first few weeks of Facebook and Twitter activity by the SVA after the February 2011 Christchurch Earthquake (the major disaster event in the earthquake series throughout 2010/2011). This analysis highlighted the power of harnessing community ethos, goodwill, motivation and momentum through open communications via social media, as the prime focus of interactions between the SVA and disaster management agencies.

A recent European example of the complex impact of social media on participant communications are the London riots of August 2011, which saw four days of the worst violence and destruction in the UK's recent history [10]. These riots have been seen as a response to the perceived neglect of public needs by a government implementing severe austerity measures [11] and were triggered by the shooting of Mark Duggan by the London Metropolitan Police. In the course of these riots, social media were used both by rioters to purposefully organise unrest and looting by UK citizens, and by law-abiding individuals to purposefully share advice about the safety of local areas, organising the post-riot clean-up, and to support local businesses whose shops had been looted or torched. The UK government admitted that it was unable to effectively monitor social media services, and briefly considered shutting down access to Facebook and Twitter [11, 12].

Data analysis from all of these case examples clearly highlight that during public events, effective communications via social media platforms must be:

- Accurate, reliable, timely and two-way (between agencies, organizations, groups and individuals);
- Influential and capable of harnessing positive thoughts and ideas (business and community ethos and goodwill as well as individual motivation); and
- Purposeful and intentional (for well-organized activity).

This of course helps us to understand the characteristics of effective "messages" and communications propagated through the use of social media platforms during extreme events. We know very little, however, about the characteristics of, or roles played by event participants when they communicate through the use social media platforms.

Barley [13] discusses a role-based approach to the impact of technology on work tasks which is grounded in Nadel's [14] work into relational and non-relational roles. He argues that roles:

- Are grounded in daily–life interactions;
- Are intimately bound to social relationships;

- Are partially defined by task performance (but subsumed an individual's skills);
- Allow an analysis of not only technological material implications but also how technological constraints are transformed into social processes; and
- Offer a set of inter-related concepts to help define links between adjacent levels of analysis [13, p. 68].

A role focussed approach to the analysis of social media use for public events, would allow researchers to focus on how event participants use such technological platforms to interact and communicate; carry out social relationships (and social processes); and perform various tasks against the background of specific events.

Relational roles (as defined by Nadel) must have a "specific other" e.g. a son must have a mother, while a *non-relational role* exhibits behaviours that are indicative of that role e.g. a professional class such as an accountant, lawyer etc. Barley concludes, however, that all roles are "bundles of non-relational and relational elements [13, p. 68] so it is difficult to arbitrarily separate the two.

In the case of a public event, we would assume that various participants would have roles to play, some of which would be relatively predetermined and well defined i.e. government agencies, and some of which would have emergent characteristics i.e. self-organising community groups, social activists etc.

Barley highlights that researchers studying the impact of technology on role-based (organisational) structures must focus on 3 elements which directly impact roles: 1) how technologies influence tasks, skills, and other *non-relational aspects of roles*; 2) how these changes influence the *relationships between roles*; 3) how properties of the social network determine *role relations and the structure's* (network) *configuration*. These 3 elements, he argues "either sustain or modify" structures such as networks as they are the "blueprints for ongoing action" [13, p. 70].

So what role does the "messenger" play in these communications? In order to address this shortcoming in our knowledge, our study has looked at participant roles and the use of social media during the "1st of May" Labour Day public event in Germany.

3   Case Study

The 1st of May is a public holiday in Germany celebrated as Labour Day. Traditionally there are Labour Day rallies and marches in many German cities. Most of the rallies and marches are peaceful events, however, historically several radical groups become violent in some of these marches. The city districts of Berlin and Hamburg specifically have a history of marches that have turned into violent riots. Because of this history the local police forces in these two cities are always supported by federal and other state police forces to contain any potential violence.

In contrast to previous years, besides a few local incidents, the 1st of May 2014 Labour Day marches were generally peaceful events [15]. In the evening a march in Hamburg turned violent and was ended by the police [16]. In Berlin the two biggest 1st May related events were a march with about 19,000 participants and the festival "myFest" with about 40,000 participants. The police in Berlin were pleased with the peaceful atmosphere of both events [17].

4 Research Design

In order to understand the different participant roles in the '1st of May' event and their use of social media to communicate, collaborate and organize, we use an exploratory research approach for data collection and analysis. We firstly accessed Twitter, a widely-used and popular micro-blogging platform according to the "total number of active registered Twitter users" [18], to collect the data for our dataset. We did this by utilizing a self-developed software tool, which collects data through the Twitter Search API by using specified keywords in order to find relevant tweets (on the 1st of May topic). Data tracking started on the 28th of April 2014 and ended on the 5th of May 2014. This timeframe ensured that the most important content regarding the 1st of May topic was collected over a time period leading up to and after the event. All keywords were tracked and merged into a single dataset for further analysis. As the selection of keywords directly influences the data that are collected we ensured that our keywords were carefully selected to effectively target the relevant data for the event. For example it is very important not to choose keywords that have different meanings in different contexts. Furthermore, the Tweets (in this case) were required to be directly linked to the event to avoid including any unrelated data. For this study we selected 6 keywords: 3 of these describe the event itself; and 3 described locations that were related to the event. Our keywords are presented in Table 1.

Table 1. Keywords for Twitter data collection (by category)

Category	Keyword	Reason / Meaning
Event	1Mai	Main topic/date
Event	1Mai_nazifrei	National socialists use this day in order to demonstrate. This keyword is used by individuals who to oppose the Nazi movement
Event	Tag_der_Arbeit	Labour movement
Location	Feuerwehrbrunnen	Hot spot for demonstration in Berlin, Germany
Location	Mariannenplatz	Hot spot for demonstration in Berlin, Germany
Location	Rote Flora	Hot spot for demonstration in Hamburg, Germany

Our data set included a total number of 13,413 Tweets generated by 7,734 accounts (participant nodes). After collecting the data, we prepared them in Excel in order to investigate the influence of certain participants in the event and the role they played i.e. ESA, organization, community group, individual etc. related to communication via social media.

5 Analysis

We conducted a social network analysis (SNA) to get an overview of the data and to detect the most important participant nodes in the network by role. To visualize the

network, we used Gephi, a tool that is available as open source software for graph visualization. The participant nodes of the network reflect the primary sources of tweets and the edges of these nodes were defined as re-tweets.

The following Figure 1 represents the SNA, which illustrates the participant nodes and the edges as the re-tweets. One of the "Individual" accounts for example has re-tweeted most (indicated by the size of the bubble), but was re-tweeted from small number of participant nodes (indicated by the gray gradation). Another example would be the account "Emergency services agency" (here the Police of Berlin) that represents a node, which has been re-tweeted very frequently by other accounts and which re-tweeted other postings very rarely.
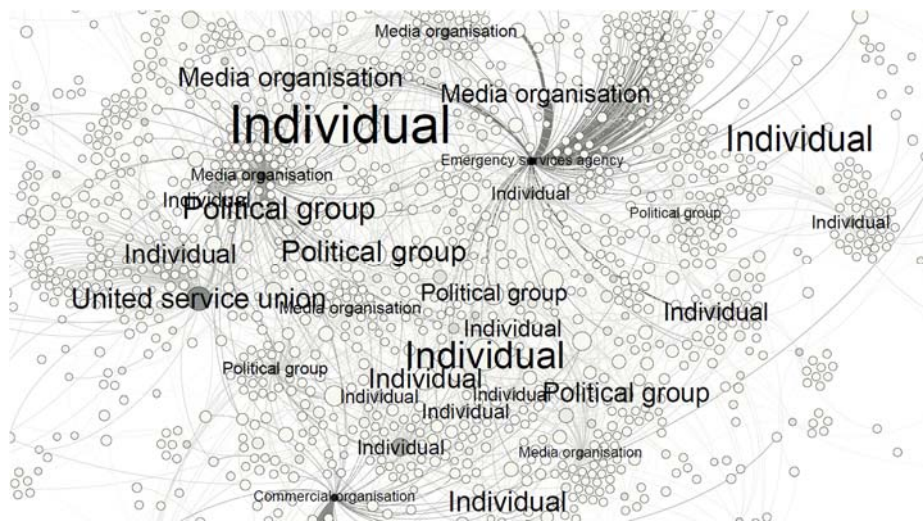

Fig. 1. Social network analysis - 1st of May (Labour Day)

By manually analysing the Twitter accounts contained in our dataset we found five primary roles that 1st May event participant nodes played:

- Emergency services agencies (police)
- Media organizations (including journalists and bloggers)
- Political groups and unions
- Individuals (politically engaged / personal experiences about 1st of May (Ausflug))
- Commercial organizations

In order to obtain a clearer overview of the data we then ran an algorithm (ForceAtlas 2) in Gephi and used the participant node tweet in- and out- degree functionality. The in-degree implies the degree of how much a participant node *has been re-tweeted*, whereas the out-degree describes the degree of how much a participant node *has re-tweeted*. In our network analysis we defined the node in-degree in the colour grey (the bubbles and arrows) with the size of the bubbles signifying the node out-degree. Table

2 illustrates our analysis of the dataset as it relates to key Twitter accounts (participant nodes).

Table 2. Data analysis

TwitterAccount (participant node)	Number of tweets	In-degree (was retweeted)	Out-degree (has retweeted)
Sorted by in-degree			
Media organisation	42	266	1
Emergency services agency	31	238	0
Commercial organisations	1	137	0
Political group	25	105	1
United service union	28	102	18
Media organisation	7	80	1
Media organisation	12	77	1
Individual (politically engaged)	47	76	3
Media organisation	7	70	0
Individual (politically engaged)	37	69	15
Sorted by out-degree			
Individual (politically engaged)	52	0	52
Individual (politically engaged)	67	0	45
Individual (politically engaged)	64	2	39
Political group	36	0	35
Individual (politically engaged)	38	1	31
Individual (politically engaged)	29	0	29
Political group	57	19	27
Media organisation	22	0	22
Individual (politically engaged)	23	0	21
Political group	34	8	21

Based on our analysis we have highlighted the following influential network participants based on the number of re-tweets (Table 3).

Table 3. Key findings

Influential Network Participants	Description	Example Tweets	Further Information
The account of a Media organisation was re-tweeted most	The node represents a left-oriented newspaper named "neues deutschland" (English: "The New Germany")	".@*GregorGysi: Botschaft des #1Mai lautet, „dass man sich nicht länger alles bieten lassen darf*"" (English: The message of the '1st May' is that you do not have to put up with everything) "*#1Mai: Polizei kesselt in Plauen Gegner der Nazidemo ein #pl1mai*" (English: Police encircled in Plauen opponents of the Nazi demonstration)	It was twittered most by a politically engaged individual, which is also the account that re-tweeted most in our dataset. It is not clear, if this node is a single person or a media outlet, but it was very active regarding political topics
The account 'PolizeiBerlin_E' (a emergency services agency) was re-tweeted second most, but twittered only 31 times	This account represents the official account of the police of Berlin	"Ca. 10.000 Teilnehmer/in-nen der „Revolutionären #1Mai Demo" erreichen gleich den Hermannplatz." (English: Around 10,000 participants of the" revolutionary '1st Mai' Demonstration are going to reach the Hermann Square)	The account was twittered most by a media organisation (18 retweets of "PolizeiBerlin_E"), a boulevard newsmedia outlet which is a 100% subsidiary of the Axel-Springer AG (B.Z. Ullstein GmbH 2014) The account was twittered second most by a single person who also retweeted "PolizeiBerlin_E" 9 times
There was participation of a grocery store node that can be categorised as a commercial organisation	There was a single tweet in the dataset, with a high re-tweet rate	"Für alle, die am #1Mai eine Überdosis Pfeffer erwartet, wir haben auch Salz!" (English: For those who will have an overdose of pepper at the '1st Mai', we also have salt!)	The grocery store used the attention of the crowd in order to make some advertising
There was a participation of a real estate company node which represents a political group	They are highly motivated to stop rising rents in Hamburg, Germany	"Welcome center im karov-iertel eröffnet! Hamburgs größte Hausbesetzung! #1Mai #1maihh" (English: "Welcome center opened in Karoviertel! Hamburg's largest house squatting!)	The account tries to get some attention of the people, during the '1st of May' issue, towards the rising rents in Hamburg. Therefore they call the people occupying some houses in Hamburg

| The united service union node was re-tweeted fifth most | It is the official account of ver.di, a united service union | #Bsirske zum #1Mai: Für ein soziales und solidarisches Europa. #Mindestlohn schnell auf 10 Euro erhöhen. (English: For a social and solidary Europe. The minimum wage must be quickly increased to 10 euros) | During the German Labour day, this account tries to motivate the participants of the demonstration and describe their demands for working conditions |
| | | Ob auf dem #Taksim, in #Berlin oder #Madrid. Wir wünschen euch einen tollen & kämpferischen #1Mai. #MayDay is ours (English: It doesn't matter where you are, whether on the Taksim Square, in Berlin or in Madrid. We wish you a great & struggling '1st of Mai') | |

6   Discussion

Our findings reveal interesting communication behaviour and emerging participant roles during the 1st of May event. The results of the SNA, the statistical analysis and further analysis of the primary participant roles indicate that ESA (in our study PolizeiBerlin_E) are central to the event and are frequently re-tweeted on Twitter. The Berlin Police while generating the 4th largest number of tweets (Table 2) actually generated the 2nd largest number of re-tweets (Table 3).

The Berlin Police have a non-relational role to play in the 1st of May event exhibiting behaviour that is typical of Police communications with the wider community. This is manifested in the topics and content of Police tweets. The characteristics of the Police tweets in this dataset (table 2) can be classified into following types:

1. Event Information:

• Start and end of a demonstration:

"*Der 18 Uhr-Aufzug hat soeben mit einer Kundgebung am Lausitzer Platz begonnen.*"

• Number of active police officers:

"*...6.400 Polizistinnen und Polizisten sind heute rund um den #1Mai im Einsatz.*"

• Number of participants:

"*Die „Revolutionäre #1Mai Demo"befindet sich aktuell mit ca. 19.000 Personen...*"

• Location:

"...auf der <u>Zossener Str.</u> in Richtung <u>Hallesches Ufer</u>." (English: address-names)

2. Traffic Information

"<u>Der Görlitzer Bahnhof ist momentan noch gesperrt</u>. #1Mai #MyFest #BVG"
(English translation: Goerlitz central station is closed at the moment…)

3. Warning

"Aus der „Revolutionären #1Mai Demo heraus werden vereinzelt Pyros gezündet, Flaschen und Steine auf Polizist*innen geworfen."
(English translation: Pyrotechnics are used in the 1May demonstration…)

4. Behaviour influencing

"Bitte meiden Sie den #Hermannplatz ab 18:30 Uhr weiträumig, da er für eine Demo komplett gesperrt wird. #Neukölln #Verkehr #1Mai"
(English translation: Please avoid the #Hermannplatz (location) from 6:30 pm widely, since it is completely blocked for a demo…")

The Police communications behaviour in turn influenced the relationship between various participant roles in the Twitter network as both the SNA and the statistical analysis indicate a "Megaphone Effect" of Police communications i.e. twittering a few tweets which are then re-tweeted by many participant nodes very often.

Another important finding shows the relationship of the top 5 participant roles and the number of their tweets (Table 2). This list is dominated by media (news), but none of the media participants have a significant effect on the 1st of May topic as highlighted by their low tweet in-degree. Only the left-oriented media roles, have a highly significant effect on the tweets and thus on the participants who re-tweet their tweets.

We also identified some individual participants and small groups who were very active according to the number of their tweets but which were not re-tweeted at all. An interpretation of this finding might be that, they were not noticed by other participants in the event because their role (and communications) in the event had no meaning to other participants. There was also a very low participation rate in the event (at least via Twitter) of extreme right-wing participants. Most of the active participants in our dataset seemed to be strongly left-wing oriented. This may be accounted for by the role of mainstream political organisations and the willingness (or otherwise) of non-mainstream participants to public commitment to beliefs.

Finally, we found that a European supermarket used the event and participation in it via Twitter, to advertise for their brand. With a single tweet, which was re-tweeted 137 times, they were able to attract highly effective attention to their products without incurring the usual advertising costs. Their role as a commercial business was effective in using the network to propagate marketing information.

As we can see by this analysis, the properties of the Twitter social network (the notion of tweeting and being retweeted) have an effect on the role relations and the network configuration.

7   Conclusion

Our analysis gives an initial overview of how participants in the 1st May 2014 event in Germany used social media (Twitter) to communicate. We have also been able to highlight 1) how Twitter influenced the behaviour of the non-relational Police role; 2) how this non-relational role (in the network) influenced the relationships between participant roles; and 3) how properties of this Twitter network (the notion of tweets and re-tweets) have determined role relations and network configuration.

We are currently performing a more detailed analysis of the communication practices of participants in this event as well as their role characteristics (emergency services agencies, media organisations, political groups and unions, individuals and commercial organization). We are specifically analysing what kind of messages are most often generated and shared and what kind of messages are ignored (and by whom).

So what of the 'messenger'? From our initial analysis we can now better understand that roles, their relationships and the social network structure in the use of social media platforms (in this case Twitter) during an event such as the 1st of May. We also understand that the volume of tweets by an event participant does not necessarily translate into attention or influence as defined by re-tweeting (and in- and out-degrees). Obviously there is some interplay between the role played by the event participant and the characteristics of effective social media communications. Our further research and analysis will focus our investigations on this interplay.

As with every study there are limitations. The event we have chosen to analyse is a public event which is relatively planned and well-controlled. It has given us an opportunity to evaluate roles through the use of social media with a smaller scale dataset, which may not be able to be effectively scaled up to a less controlled and more chaotic event (such as a riot or crisis event). Our initial analysis has also been based on the identification of tweets and re-tweets by keyword. Whilst this can be helpful to gain an initial understanding of event participants and their roles and influence via Twitter, it gives us none of the subtle understanding or context behind the contents of each tweet. The next stage in our analysis will seek to address this limitation. We must also understand the roles of event participants who did not seek to communicate via Twitter (for example right-wing political groups) and why this was the case, so as to better understand the reasons for, and motivations behind event participant selection and use of social media such as Twitter

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