Social Media: To Deal Crisis Circumstances

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Abstract:

Social media and online services with user-generated content (e.g., Twitter, Facebook, Instagram and YouTube) have made a mystifying amount of information obtainable. Administration officials seek to resistor these resources to progress services and communication with citizens. Important potential exists to classify issues in real time, so crisis managers can monitor and respond to issues about public safety. Yet, the complete capacity of social data brooks creates extensive noise that must be filtered in order to discover expressive patterns and trends. Vital events can then are recognized as points in activity, while event meaning and penalties can be deciphered by tracking variations in content and community sentiment. This Paper presents results from an investigative study with the comprehensive objective of understanding social media use by administration officials as well as community administrations, industries, and the community at huge. A key objective was also to understand social media use specifically for dealing crisis circumstances.

Keywords: Social media, Crisis information, Information visualization, Word cloud, Focus group study.

1. Introduction

People are increasingly relying on social media for communication with their family, friends, colleagues, businesses, and the administration. The capabilities to enable group interaction provide new and exclusive chances for public leaders, elected officials, and administration service providers to inform, and be informed by, the citizenry [1]. Twitter, Facebook, Instagram, YouTube, and other services with user-generated content have made a staggering amount of information available online. In 2017, during the period of our study, worldwide, there are over 1.94 billion monthly active Facebook users for March 2017 (Facebook MAUs) which is an 18 percent increase year over year. There are 1.15 billion mobile daily active users (Mobile DAU) for December 2016, an increase of 23 percent year-over-year. 1.28 billion People log onto Facebook daily active users (Facebook DAU) for first Quarter of 2017, which represents an 18% increase year over year (Source: Facebook as 05/03/17). There are 1.74 billion mobile active users (Mobile Facebook MAU) for December 2016 which is an increase of 21% year-over-year (Source: Facebook as of 02/01/17). At 1.94 billion, Facebook has more monthly active users than WhatsApp (1 billion), Twitter (328 million) and Instagram (700 million)—combined (Source: CNBC). Facebook continues to reign in popularity over other social media channels, but the competition is mounting [2][3].

All this information and deep reach are readily accessible for administration officials to tap into and influence for enhanced services. However, the treasure trove of information comes with extensive noise that must be cleaned to make this information beneficial and reliable.

Administration officials seek to leverage these resources to progress services and communication with people; especially segments of the population that previously were problematic to scope. Yet, the complete volume of social data streams generates extensive noise that must be cleaned to be useful. The desire and potential exist for classifying and responding to issues in real time for more operational emergency management as well as enhanced public safety and general quality of life. For example, critical events of interest (e.g., earthquake, flash mob gatherings, protests etc.) can be recognized as points in the social media volume. Problems of concern for public safety or general quality of life can be discovered, monitored, and mitigated by analyzing social media streams to detect meaningful patterns and trends (Fig.1).

Similarly, monitoring these patterns and themes over time could provide officials with visions into the observations and mood of the community that cannot be collected through outdated approaches (e.g., phone or mail surveys) due to a diversity of reasons, including the excessive cost as well as the limited window of opportunity for influencing or mitigating events as they evolve. Perhaps most significantly for emergency management, no outdated technique can provide insight in real time. Investigations require significant time and effort prior to data collection, during the collection process, and for analyses of the results, which often take months to finish. Secondly, practical costs are associated with survey activities, making them especially difficult in light of reduced and shrinking budgets of

administrations at all levels. Finally, once completed a survey captures observations at a single point in time. Although it is possible to use surveys at intervals to screen the progress, it is not a mutual practice, considerably raises costs, and frequently does not reach important sections of the public.

Fig1. Social media streams to improve services and communication with people.

Data mining of different real-time feeds of social streams related to real-world events are needed to enable officials to make sense of the massive amount of information generated. In so doing, administration should be able to act more efficiently on matters both in on-going issues of public concern and major weather or traffic disruption, public safety. Specifically, we have begun to:

1) Leverage and further refine tools for gathering and connecting large amounts of public social media data appropriate to Arlington County.

2) Store the collected social media data over a period of time into a digital library, and

3) Classify research and implement applications of multimedia analytics and text mining for administration services and communication.

To address these goals, we conducted investigative focus group interviews with key stakeholders in administration and community organizations, and developed tools to analyze and extract data more significant and practical for local organizations, administrations and citizens.

Our target information sources included official Arlington County Facebook pages [4], Twitter feeds [5], blogs [6], news, community forums, and appropriate postings by the community on social media sites. Applications of such examines could include observing public belief before and after large public events, checking scheduled or unexpected activities, recognizing and classifying imperative public matters over time and location, enhancing civic recovery in response to emergencies or misfortunes, and tracing the expansion of long-running themes in domestic lifespan.

Contemporary case studies, such as published by Queensland Police Service [7] outlined the experiences and best practices for engaging and informing citizens during a historic flood. To the best of our knowledge, this study is the first to survey across a wide range of administration agencies and public organizations, maintained by data analysis of present online communications.

2. Social Media and Administration

Social media are internet-based applications designed to facilitate social interaction and for using, developing and spreading information through the world. Social media build on several of the same concepts and technologies of Web 2.0, most basically, the creation and exchange of user generated content [8]. Broadly, Web 2.0 and social media are considered social software, i.e., software that enables people to connect or collaborate through computer-mediated communication [9] [10].This type of software has happened for years in the form of online bulletin board systems, forums, and newsgroups. In recent times, however, blogs and micro blogs (e.g. twitter), RSS feeds, tagging systems and collaborative filters have made social software easy to use and extremely scalable leading to superior acceptance and usage.

a. Social Media Use by People

Social media have changed the way people get information about what's going on in their societies, and national and global existing proceedings. They deliver innovative methods for residents to share information and to interact with each other with chosen bureaucrats and administration agencies. A national study conducted by Pew Internet & American Life in 2010 finds that almost a third (31%) of all online adults in the USA used social tools such as blogs, social networking sites, and online video as well as email and text alerts to keep informed about administration activities[11].

A survey conducted in the US by the American Red Cross [12], 75% of respondents reported they would use social media in predicament and civic-related situations (e.g., traffic jam, car crash, potential crime, or downed power lines). Nearly half of accused reported that they would use social media to let others know they were safe in an emergency; 86% report they would use Facebook; 28% would use Twitter, and 11% would use a blog.

According to Palen, Hughes, and colleagues [13][14]. These studies specifically focus on the use of Twitter during tragedies and conditions of social meeting, such as mass political protests, rallies. They stated that twitter use under pressure and the users may broadcast more up to date and timely information than administration organizations.

b. Social Media Use by Administration

Twitter and other social sources have been

effective in early event spotting [15] [16], the reaction time of which can be even sooner than authorized sources (e.g., earthquake reporting). In the case of nonstop monitoring, social media can help quantity the effectiveness of control processes and propaganda.

We have been reading social media usage and influence as part of an on-going longitudinal research of Internet use and impact in Blacksburg, Virginia and environs [17]. The communications specialists in town administration monitors twitter for related posts that would help from a reply or should be brought to the attention of town council as a citizen suggestion.

From our preliminary study of social media use in Blacksburg, we found that most often the person posting tweets or managing an organization's Facebook page was not from the organization's leadership. Instead, a college student or other young adult was often working in tandem on behalf of the organization to post announcements, updates, or other information.

3. Learning Approaches

We gathered and examined area-specific social media sources, and conducted focus group interviews with county officials (specifically, personnel from emergency management services, the police department, and volunteer leadership office), including a questionnaire about their social media use and community association. We were able to recruit 50 participants and organized them into three separate focus group sessions held in April and May 2017 in Arlington. At the inception of each of the interview sessions, we asked participants to complete an online questionnaire.

The focus group sessions continued in two key phases. They began with participants involved in electronic brainstorming to create a number of thoughts rapidly, followed by a process whereby they recognized categories that grouped the thoughts by relationship.

We used different Twitter analytical tool, such as the Archivist [18] to collect tweets from local organizations, including Arlington administration that were public in nature.

We did semantic analyses on the Twitter data to detect common topics and to distinguish followers by their profile data; we conducted simple frequency counts to calculate number of 'followers' and 'followers of followers' of a given organization. We used the visualization software wordle [19] to represent the results of the Twitter analyses as tag clouds in order to be able to cleanse and make greater sense of huge volumes of data faster and simply. For the YouTube video collections, we searched all

YouTube videos for the tags or video with the title 'Arlington County' and signified the search results in a tag cloud demonstrating the most frequent tags in the image collection.

4. Outcomes

Our findings from the experimental study are based on the focus group interviews and participant questionnaires (N=50), and the development of tools to analyze social media data we collected.

The results fall into three main zones:

1) Local administration uses social media without knowing its costs and benefits, or who their actual audience is, who in their society should monitor communications, how and when they should be answering, and what effect their social media communications have on the public;

2) New tools are needed to help administration and nations make sense of the massive volume of data that is being produced, to exemplary the flow of information, and to detect patterns over time; and

3) Digital libraries are needed to archive and curate produced content, especially for crisis and social meeting circumstances.

Framing questions for focus group interviews are as shown in below topics:
1. Missions and objectives of the organization. 2. Achievement using the social media. 3. Concerns and difficulties about using the social media. 4. Social media that would be helpful to the society.

a. Focus Groups: Questionnaire

Each of the 50 focus group participants completed an online questionnaire at the beginning of their focus group interview session. Of this sample, 30 (60%) were female and 20 (40%) were male. The majority (84%) was white, 64% were married and 92% were employed on a full-time basis.

Most respondents stated that they have ideas for refining things in their community at least once a month (76%) and that they regularly get together with others who are well informed about local issues. 36% are reported that they worked to bring about change in their community on a daily basis. Almost half of the participants (48%) reported that they either posted comments, pictures or video online, or blogged about a political or social issue in the past year. Over half (56%) of respondents used social networking sites on a daily basis, and 76% used these sites at least once a week.

All respondents felt that the region administration should contact citizens by way of phone call or text message during a crisis. 84% felt that social networking sites also should be used for this purpose, and 72% felt that blogs or micro blogs

should be as well. Over half (56%) of respondents stated that they were at least somewhat likely to use one or more types of social media to contact family members during a crisis. However, only 24% were likely to report a crisis to local administration agencies via social media. The majority of respondents stated that talking to others in person or by telephone was the most important source of local information.

b. Focus Groups: Organization Factors

The organization factors that focus group participants recognized include policies, legal issues, costs and training. The organization requires that polices be adopted to provide the environment needed for employees to attain their work objectives. To utilize social media effectively, employee activities and roles are established through HR to clarify job descriptions and ensure connected types of communication are managed. Some evolving applications allow people to contribute geo-tagged photos and video to a community database.

Preliminary evidence from a national study [20] indicates that the use of social media for public purposes is not as powerfully connected with education. This may be because powerful individuals exist at all social levels, and they may deliver information to members of their social circles not only face to face, but also by mobiles.

c. Analysis of Facebook Comments

Arlington County administration had roughly 12166 fans at the end of 19th June 2017. We analyzed a two-month period (April 1–May 31, 2017) of posts by the county and comments from the public by conducting a simple content analysis by topic. There were a total of 88 posts; the top most frequent topics are shown in Fig.2.
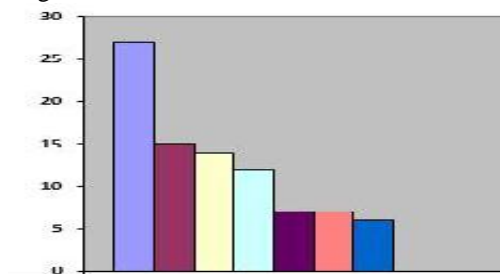

Fig. 2. Facebook topics Arlington County.

▣ Traffic	27
▣ PSA	15
▢ News	14
▢ Weather	12
▣ Misc Event	7
▣ Food Event	7
▣ Exercise Event	6

Fig.4: Tag cloud of Arlington YouTube videos.

The most common posts by the County on the Facebook page were about traffic, followed by public service announcements (PSA), news and weather related posts were followed by various events (biking paths, walking, music or film) in terms of frequency of posts during this two-month period.

There were a total of 174 public comments to the county posts during this two-month period. Half of the comments related to about a fifth (19%) of the county posts. Fig. 3 shows the distribution of the bulk of the comments on the same top County posts seen in Fig.2.
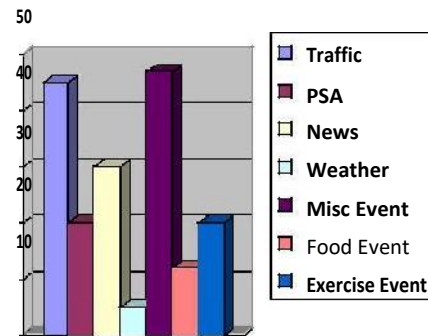

Fig.3: Public comments by Arlington Facebook topic.

The comments are mostly related to traffic and miscellaneous events (such as food, music, and film). Exercise events (biking, walking) and news announcements generated the next most frequent number of comments from the public. Almost all the comments were highly consistent with the social media policy of the County (e.g., no vulgarity or off topic comments) and were very positive in tone, including many "Likes".

Lastly, we collected videos in YouTube relating to Arlington, Virginia and conducted a tag analysis of the video collection .We performed a search and the phrase 'Arlington County;' this produced about 3480 videos from YouTube (Upload date by this month). We generated two types of tag clouds using video titles and tags (see Fig.4).

As noted earlier, a tag cloud as visualization fast and simply represents the frequency with which dissimilar terms appear in a search thereby providing a snapshot of what is in a large isolated collection. The more frequently a term appears in an image collection, the larger it appears in a tag cloud. The cloud visualization also provides a sign of the importance of various public problems to members of the community. The recurrent civic themes revealed in the video analysis can be further illustrated in to categories shown in Table 1.

Law enforcement	Police, cops, officer, courthouse, robbery, accident, ACPD, surveillance
Social issues	Environment, diversity, community, city, neighborhood, accountability
Transportation	Metro, street, boulevard, highway accident, parking, transit
Economic development	Growth, sustainability, development, bank, private, local
Political	Government, electronics, agencies, department
Communication	Media, ABC, NBC, CBS, television, news, network, bilingual, Spanish

Table 1: Tag cloud categories for Arlington videos.

A further clustering of video tags and video titles as shown in Table 1 allows administrations and other users to make sense more easily of the interests and needs of the community as expressed in the YouTube collection at any given point.

5. Debate and inferences

The experimental study was intended to advance technologies and systems for social media analysis relating to both routine day-today civil life and critical incidents. The results begin to recognize and address a combination of technical and social science challenges. On the technical side, these include:

1. Recognizing related information precisely and in a timely manner, particularly from short content micro-blogging sites; the limited information in a tweet (i.e., less than 140 characters) makes it difficult to classify its meaning and context which may lead to incorrect classification and misleading analysis of data;

2. Alerting administration officials to the analyzed information from multiple social media sources; due to the enormous size of the social media data stream, it is a contest to rapidly analyze the composed information from dissimilar sources and to make a conclusion based on the analysis; and

3. Visualizing the present and former status of incoming information and the analysis of it; simple yet informative visualization design is essential in making-sense of the data presented. We support the sense-making process by integrating interaction methods with visualization to deal with huge quantities of data.

On the social science side, our experimental study results build on social network analysis and the use of social media. We focus on Arlington as our test case in order to analyze information, its use and impact related to local, state, national, and international events — since it has close connections to the US capital.

Our social media data analyses are intended to help administrations and nations of Arlington county to know how and where to get useful information and acute communication in the event of a crisis or social meeting condition. Our tools should help administrations and citizens to monitor and make sense of the multiplicity of voices and information that improve the quality of life in their communities.

By mining content and services covering multiple media types (i.e., text, audio, image, and video) we can develop tools to recognize events and alert administrations/governments, citizens, and community groups to see quickly the 'big picture' through visualizations of social media activity, content and changes in both over time. The intent is to enable preemptive responses, as routine problems or crises start to emerge, as events reveal, as individuals and groups react, and as plans are made for improved services and communication. Such capabilities are relevant to a broad range of administration throughout the US and globally. Given the efficiency of communication provided by social media, coupled with the potential to reach many constituents quickly, administration should seek to understand and to influence these increasingly popular communication channels.

Administrations, local organizations and citizens will continue to use a combination of outdated communication approaches (e.g., newspapers, radio, televisions, magazines, telephone) and evolving tools, smartphones and social media. Government knows they have miscellaneous audiences with diverse needs and preferences. Social media are just additional set of communication channels to get word out and help the interests of people.

There will remain to be legal issues regarding the interaction between outdated communication approaches and social media. These include managing diverse methods that the community can report a problem to the specialists.

Future research will help people and administrations to direct the evolution from outdated approaches to evolving developments. The rising number of cities and towns that have additional involvement with new media will guide others in diminishing the costs and drawbacks.

The aids, especially to the residents, in terms of larger access to information (e.g., searchable online video of meetings of interest) and larger distribution of worries and thoughts will lead to augmented consciousness, shared efficiency and community contribution. The aids to administration include preemptive problem solving and positive public relations that lead to greater political efficiency and civic hope.

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