Letter: The use of twitter as an early warning system for terrestrial search and rescue *

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Dear Editor,

Recently I was informed about an automated email alert system, set up for a local Lowland Search and Rescue team. The team carries out searches for lost and missing people in the British countryside, at the request of the police, local government or fire brigade. To put this into context, the team of about 100 volunteers uses dogs and foot teams and has some specialist water and height access ability. The team operates (including supporting neighbouring teams) over an area of roughly 5-8,000 square miles. The team is alerted by a 'hotphone' number, available to police and fire services, which rings the mobile phone numbers of a small group of senior team members, who then assess the type of search required and (assuming they accept the job) stand up the team with whatever specialism is required. The callout and operation management is handled through the software D4H ([D4H] Technologies, 2014), which enables texts and emails to be sent to groups and subgroups within the larger team.

The 'twitter' alert system involved scanning the twitter feed of the local police force, and automatically forwarding any tweet that contained the keyword "missing" in the form of an email to the management team (as above). The intention was that this would give the management team an early warning and allow them to make preparations in a more timely manner than waiting for the full process of a Police Search Liaison Officer (POLSA) to be appointed, for them to get to grips with the situation and then at some later point give the team their first notification.

The use of twitter as an early warning system for the spread of disease (Chew & Eysenbach, 2010), severe weather (Cates et al, 2013), medicine (Williams et al, 2013) and natural hazards (Vieweg et al 2010), (Chatfield et al, 2013) is well established, but this use struck me as being both original and untested.

I did however have some concerns with this method:-

Firstly, this was clearly *not* the intended use of the stream by the Police. Although by its nature twitter is in the public domain, I had some concerns about how this could be viewed. There was some risk

that the activity may be seen as a form of 'ambulance chasing' or solicitation for 'shouts' (the colloquial term for operational deployment). In the very worst case scenario, there could be attempted moral pressure put upon police forces by SAR teams who have seen these twitter alerts and decided independently that they should be involved.

Secondly, I had doubts about the efficacy of the system in this simple form. Even a cursory look at the stream shows that a number of the tweets were not relevant to the team, even though they contained the key word.

With this in mind, I decided that it would be useful to test the effectiveness of twitter as an early warning system in a Lowland SAR context, using a comparison of actual tweets with the keyword to a randomly generated tweet alert system.

Method

I decided that the period 1st August 2013 to 31st August 2013 was a reasonable period of time to study and to observe any patterns. During this period research period there were 183 tweets, 80 shouts and 183 randomly generated messages (to match the number of tweets, to give them the same chance of hitting a shout). The randomly generated messages were created in a Microsoft excel spreadsheet.

After identifying matches, the tweets and shouts were interrogated to determine if the tweet related to the shout, and so could be said to be worthwhile in preparing the team. The random messages could only be assessed as to whether they occurred on the same day or not.

Results

The randomly generated alerts matched shouts on 25 occasions, coinciding with 30.9% of shouts, which was close to all tweets containing the word "missing" (24 matches, 29.6% of shouts).

However, when the tweets were analysed to see if they were both before the callout and definitely directly related to the subsequent shout, only 5 matched, at 6.2% of the total available jobs.

	Number	Percentage
Random alert matches shout	25	30.9%
Tweet date matches shout date	24	29.6%
Tweet is before and related to shout	5	6.1%

On ten occasions both the random alert and twitter feed were on the same day as a shout, and two of those occasions could be directly related to a later, actual shout.

Conclusions

The randomly generated results were equally likely to match the shout date, with both random alert and tweet matching approximately 30% of the actual shouts, however *only 6% of tweets led to a callout related to that tweet*. There is clearly a methodological issue with only predicting the date (as there is with counting any tweet with the correct search term) as what is really required is some form of prediction that can be shown to be related to actual deployments.

One way of testing this against a random distribution could be to also include a random time and see if that falls within some tolerance (say 2 hours) of a deployment. However, looking at where the deployments have followed connected tweets, it is not necessarily the case that they follow any consistent time pattern, or that this method would be any more realistic. So, there is clearly a flaw in the comparison method, but overall it suits the purpose for some first-glance investigation here.

The real reason that the match of connected tweets to deployments was so low is related to my objection one – in that this is not what the stream is designed or intended for. The reason there is no relationship between the deployment mechanism and the social media stream is that none was ever intended.

This system could work more efficiently with the inclusion of an additional, specific hashtag, to separate general social-media-directed posts from those that relate to upcoming shouts (something like #SAR), but then it is hard to see what purpose that would serve, as there is *already* a mechanism for alerting teams, through the POLSA system.

To rephrase, the only way to make twitter work as an effective alerting system is to change its fundamental purpose to that of an alerting system. Clearly though, an open, publicly viewable alerting system is not ideal, as much of the relevant information is not for public consumption, which means a

follow-up phone call or secure communication would be required, which – seeing as this already happens – makes the twitter component redundant.

In conclusion, the real problems with twitter as an early warning system in this context stem from the fact that it is simply not intended for that purpose, and as such will never be fully appropriate.

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