An Organized Collaborative Work Using Twitter in Flood Disaster

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ABSTRACT

The use of Twitter in emergencies in providing vital information has become increasingly popular. Twitter users are able to use its services to work collaboratively regardless of physical distance. This paper is concerned with the use of Twitter in providing enhanced communication channels and assisting people in emergencies such as floods. An example of a case study is included in this paper.

Keywords

Social network, Organised collaborative work, Twitter.

1. INTRODUCTION

The development of social network sites and the corresponding improvement in the type of services they provide has led to a sharp increase in the number of users of such sites. There are many factors that have influenced this development. Clearly, they serve an important human function of social interaction. Users are able to connect with each other easily. They can find out current information about each other and exchange data such as pictures and documents. As such, these services meet a definite human desire [1]. Crucially, these services are available in many languages, which allow them to have a global reach. The success of these services has also depended on the fact that they do not require data storage and, most importantly, they are free. Users also do not need technical knowledge to use these services [2]. Internet access is a requisite however. Examples of such social network sites are Facebook, MySpace, Twitter and Flicker

Social network sites allow users to communicate together regardless of their physical location and social distance [3]. Accordingly, social interaction facilitates users to work in cooperation with one another. The 'community practice theory' mentions such collaboration: "Communities of practice are groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly" [4].

The emphasis on this paper will be on Twitter. This social network site facilitates collaborative work as users can exchange instant messages known as 'tweets'. Tweets can be sent through Twitter interfaces which are supported through various mediums such as text messages and other third party services. This allows for the services to be more mobile and flexible, increasing the potential for collaborative work [5].Twitter also provides ways of improving the organisation of communication between users. Messages can be addressed to certain users by using the '@' key and specific topic can be identified using the '#' sign for example. Twitter therefore marks an attempt to provide an excellent collaborative working service in the context of a social network.

Twitter is used for a variety of purposes. The focus in this paper will be the use of Twitter in emergencies. The use of Twitter in allowing users to work together collaboratively by improving communication in the case of the recent floods in Jeddah, Saudi Arabia will be considered.

2. DATA

In this paper a certain hash-tag has been assigned a pseudonym as (#FloodSample) to protect privacy. This was chosen instead of others hash-tags. #FloodSample was chosen because it was developed objectively to facilitate collaborative efforts, participations, notifications and emergency warnings related to anticipated heavy rain. #FloodSample was released on 24/01/2011, the same day that heavy rain was forecast to fall in Jeddah. #FloodSample was launched by a group of 30 twitter users with high numbers of followers (one user has 16,254 followers). This organised collaborative establishment of #FloodSample has led to a crucial role in increasing the use of #FloodSample. As a consequence, it became the most common and important primary source of communication regarding events on the ground. It should be noted that this #FloodSample were prepared as a result of a similar tragedy which occurred end of 2009 in Jeddah, which led to hundreds of deaths and missing people. Property was destroyed and there was significant damage to infrastructure.

The data collected from #FloodSample could be used for two purposes. The first purpose was to assess the impact that the organised collaborative establishment of #FloodSample may have on tweet numbers. This was done at the end of each day starting from 24/01/11 to 01/02/2011. The results for these dates were collected by the third-party service, PeopleBrowsr [6] . The second purpose was to assess the connection between the improvement of collaborative work by participants and the volume of broadcasting updated information about the extreme circumstances of the flood. On the day of the floods, 26/01/2011, the contents of tweets for #FloodSample were observed from 10:00am to 8:00pm by using the public timeline on Twitter, with random 200-tweets per hour in ten-hour samples. The Archivist application was used in making this observation [7].

3. STUDY FINDINGS AND DISCUSSION

With regard to the first purpose, the quantitative analysis of #FloodSample produced results which show the effect of organised collaboration establishment of #FloodSample on the number of tweets. For example, the number of tweets recorded rose rapidly from 282 on 25/01/2011 to 31,853 on 26/01/2011. The increase in the number of tweets is based on the change brought about by severe circumstances. This significant increase demonstrates that the organised collaborative establishment of #FloodSample was crucial in coordinating the efforts of Twitter users which increased the unity and the coherence of collaborative work. The results of the predefined objectives of # FloodSample directed users to the correct location to post tweets (figure 1).
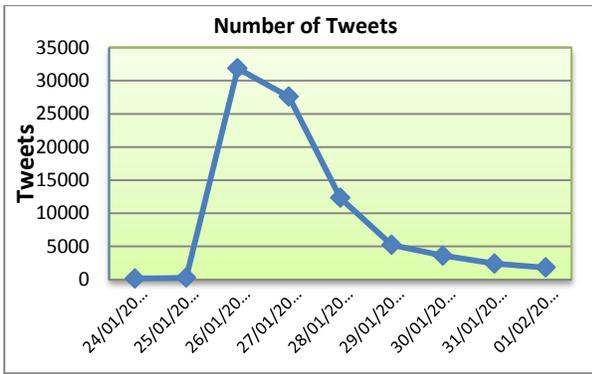
Figure 1. Recorded number of tweets.

In relation to the second purpose mentioned above, it was shown that there is a relationship between the nature of the data contents and the development of the flood. This was based on observations of exchanged contents of tweets on the day of the floods. As the severity of the flood increased, tweet content became more intense. Data content was categorised into three phases: precautions, warnings and reporting. Real translated examples for each phase are shown in figure 2. It was determined that each phase has its own representation which illustrates the severity of the development of the flood.
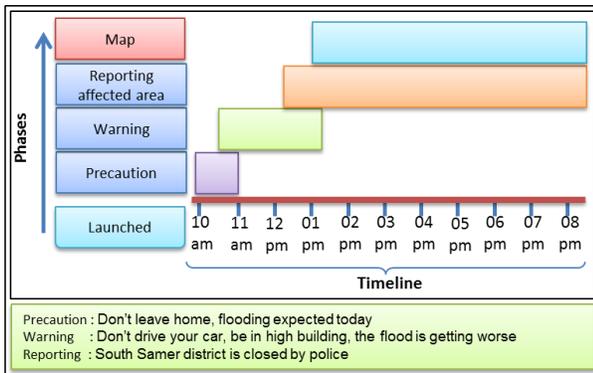

Figure 2. Timeline of the flood in relation to Twitter Activity.

This organised collaborative work has led to many benefits. The topic #FloodSample has been released to reduce the effect of floods. The most significant has been the collaborative design of a map. This map was collaboratively designed as a response to assist the affected population in avoiding flooded areas. A number of volunteers worked together to collaboratively annotate several maps of Jeddah, provided by Google Earth. The data provided by Twitter users was used in the annotations. It was considered that the first versions of these maps, posted between 1:00 and 2:00 pm, were not sufficiently comprehensive in terms of annotation. However, after an hour, more accurate versions of these maps were posted. These continuing improvements were considered to result from the organised collaborative designing of these maps, which was crucial in enhancing the reporting of flooded areas and

directing affected people to areas of safety and assembly, such as governmental-temporary centres (figure 3). This beneficial collaborative work in designing the relevant maps was greatly assisted by tweets posted which mentioned certain warnings and reports. These maps also allowed the affected people the opportunity to have an overview of events as they unfolded on the ground and directed them in seeking help well.

Figure 3. An example of collaborative developed maps.

4. CONCLUSION

This paper has examined the use of Twitter use in facilitating organized collaborative work in the case of an emergency such as a flood. The results of this study show that the use of Twitter has assisted such collaboration work. In addition, in this disaster Twitter was successful social media service due to its ease of access and flexibility through services such as instant messaging. A limitation on this study is the observational records, which were sampled for only a ten hour period. This data may not be sufficient to produce quantitative predictions for future natural disasters. More research could evaluate the comprehension and analysis of the management of data in the event of natural disasters. This could also assist in the development of social network services.

5. REFERENCES

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