

# Chapter 50

## Twitter Data Mining for Situational Awareness

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### ABSTRACT

*The most recent catastrophic events, from the 2010 Haiti earthquake to the devastating 2013 Colorado floods, have shown a strong adoption of social media platforms by ordinary people. The data and metadata produced by the users during and after the extraordinary situations could have enormous potentialities if integrated with the traditional systems for emergency management and used for hyperlocal situational awareness. The great majority of the current literature is focused on Twitter for several reasons strictly linked to the architectures and practices of use of the platform itself. It is possible to classify the existing systems based on the analysis of Twitter data at least in three different categories: 1) semantic systems, 2) metadata systems, and 3) smart self-learning systems. In this chapter, a review of the most significant and important tools used to analyze Twitter data will be presented and an innovative and smart solution will be proposed for future development.*

### INTRODUCTION

The most recent catastrophic events, from the 2010 Haiti earthquake to the devastating 2013 Colorado floods, have shown a strong adoption of social media platforms by ordinary people. The data and metadata produced by users during and after extra-ordinary situations could have enormous potentialities if integrated with traditional systems for emergency management and used for hyperlocal situational awareness (Foresti et al., 2015a). The great majority of current literature is focused on Twitter for several reasons, in particular, the architectures and practices of the platform itself. In the following section, an

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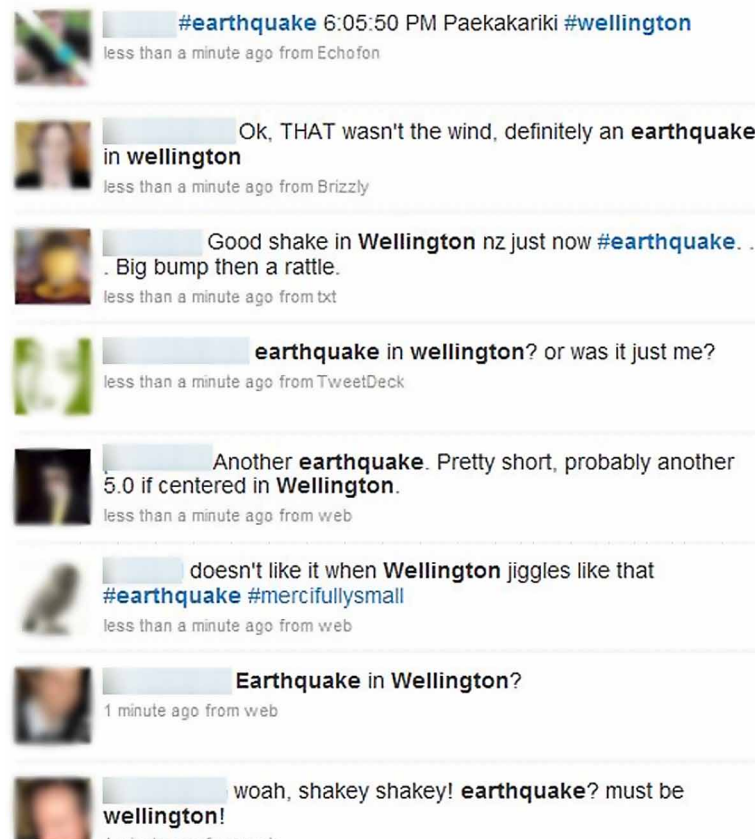
overview of social media use in extra-ordinary contexts will be presented, with a specific focus on the Twitter social media platform. Following this, in a section dedicated to the Twitter systems classification for situational awareness, a classification of the existing systems based on the analysis of Twitter data will be provided on the basis of the following three categories: 1) semantic systems; 2) meta-data systems; and 3) smart self-learning systems. Finally, in the future research trends section, an innovative and smart solution will be proposed for future development.

## BACKGROUND

### Social Media Use in Extra-Ordinary Contexts

Social media platforms are built from the beginning to be used socially, and oriented around collaboration and sharing. These potentialities are emphasized in extra-ordinary contexts, when ordinary people adopt these tools to provide or search for first-hand and real-time information regarding a certain event (i.e. an earthquake, flood, etc.) (Lindsay, 2011; Taylor et al., 2012). The most recent catastrophic events, from the 2010 Haiti earthquake to the devastating 2013 Colorado floods, in fact, have shown that these platforms have been strongly used both during and after disasters (Figure 1), allowing a real-time dissemination

Figure 1. An example of tweets posted on Twitter during the 2013 Wellington earthquake



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