



Original research article

Using Twitter for foresight: An opportunity?

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ABSTRACT

Twitter is a popular micro-blogging service and platform for public real-time communication. Concerning foresight, the value of Twitter has not been discussed or examined yet. Here this article concentrates on and considers different applications to examine how to use Twitter in foresight exercises. First, Twitter is discussed as a data source for retrieving input to roadmapping or scenarios. Therefore, an analysis framework is introduced and illustrated for the case of *#quantifiedself*. Second, options are outlined how to interact with a global network of people using Twitter as communication platform, e.g., for being used during foresight workshops or receiving input for scenario development. As the results show, both, the monitoring of topics and technologies, but also the active user engagement, are supported. In summary, Twitter is an opportunity to extend the considered data sources and to increase the number of involved stakeholder views. While the reliability of Twitter data still requires critical reflection, this article implies many new research opportunities.

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1. Introduction

Today, there exist many different social media platforms which vary in functionalities, user groups and scope, but are an important source for real-time access to public opinion (e.g., Kietzmann, Hermken, McCarth, & Silvestre, 2011). On these platforms, users share their personal views and opinions and thereby might be an option in foresight exercises to emphasize societal developments and discussions. Therefore, aim of this article is to examine internet sources and social media for their use in foresight. This work concentrates on the platform Twitter owing to its diversity of contributing actors (e.g. individuals, associations or firms) and elaborates possible applications in the context of foresight. In contrast to blogs, tweets are much shorter (140 characters), contain hashtags that can be used for further analysis, and often contain links that direct to additional content.

Twitter has established as a worldwide micro-blogging service and platform for public communication (Bruns & Burgess, 2012; Java, Song, Xiaodan, Finin, & Tseng, 2007). As both a social network and an information-sharing platform, Twitter offers real-time news and covers a broad spectrum of topics. Twitter thereby aggregates many opportunities for conducting scholarly research, and so has attracted rising attention in recent years. Obviously, each scientific discipline has diverging interests. Whereas some study human communication behavior and social networks (e.g., Marwick & Boyd, 2011), others perform trend predictions (e.g., Asur & Huberman, 2010) or observe the online communication during crisis and natural disasters (e.g., Terpstra, de Vries, Stronkman, & Paradies, 2012). A lot of promising work from other disciplines has been

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published, but the potential of Twitter for foresight has been rarely discussed so far. In general, the use of Web 2.0 and social media is addressed in a range of articles on future policy planning or trend recognition (e.g., Cachia, Compañó, Ramón, & Da Costa, 2007; Grubmülle, Götsch, & Krieger, 2013; Haegeman, Cagnin, Könnölä, Dimitrov, & Collins, 2012). However, the use of Twitter as an information source or platform for foresight exercises is rarely considered, although a lot of options actually exist. Furthermore, foresight addresses social change (e.g., Salo & Cuhls, 2003), but there are no established data sources for the automatic analysis. Here, Twitter might be an option, especially with regard to establishing *social indicators* to measure the public discussion or opinion within a systemic perspective of analysis.

These observations lead to the research question addressed in this article: Does Twitter have any potential to be used in foresight? This relates, on the one hand, to Twitter as a data source and what can be (automatically) retrieved from it. Therefore, a framework is developed to illustrate the benefit. On the other hand, Twitter as a social media platform enables active engagement and user interaction; some examples are described.

This article begins with introducing Twitter and its basic principles in Section 2. After describing the scientific discourse about foresight and Web 2.0 in general, this article examines the opportunities that arise from Twitter in Section 3 related to Twitter as information source or platform in foresight. Then, applications are outlined for scenario development or roadmapping in Section 4. Finally, the results are discussed and conclusions are drawn in Section 5.

2. Twitter: an overview

The following introduces Twitter and its key characteristics and the principles of Twitter analysis. Then, an overview on Twitter as a research field is given.

2.1. Key characteristics

Twitter was launched in October 2006 and has become the largest micro-blogging service since then with currently 500 million tweets per day (Twitter, 2015). According to a recent statistic, around 22% of the worldwide internet users are active on Twitter (Globalwebindex, 2014). This article concentrates on Twitter because of its broad spectrum of covered aspects, the contained web links to additional content, the global spread and because it provides real-time access to user-generated content. Compared to other services Twitter is not only designed for disseminating news but also for active user engagement and an exchange of messages as tweets.

In particular, Twitter has five functionalities: tweets, hashtags, @-messages, retweets, and follower relations (see Table 1 for an overview). Each user can publish tweets and subscribe to the tweets of other users by *following* them. This creates a social network of users and follower relationships as a directed friendship model (Marwick & Boyd, 2011). This is in contrast to the undirected models of other social media platforms as, for example, Facebook. Each tweet can be forwarded as a retweet, be directed to other users by @-messages, or annotated by a #hashtag. Additionally, the tweets can contain web links referring to, for example, news articles, press releases, or reports.

The main types of interaction on Twitter are daily chatter and conversations, news reporting and information sharing (Java et al., 2007). Bruns and Burgess (2012) emphasize the role of social media channels such as Twitter in today's public communication as being used first primary in private communication, but this has changed within the last years. Social media and Twitter are meanwhile increasingly used by politicians and organizations for communicating with their consumers or citizens. Moreover, Twitter developed from sharing mostly personal information to sharing diverse information (see, e.g. Risse, Peters, Senellart, & Maynard, 2014).

To access this debate is most interesting for foresight, in particular to engage with different groups and stakeholders. So, in recent years, Twitter has established and a wide range of applications evolved as, for example, in enterprise-related communication (e.g., Stieglitz & Krüger, 2014), during crises and disasters (e.g., Terpstra et al., 2012), or in scholarly communication (e.g., Holmberg & Thelwall, 2014). Especially, Twitter plays an increasing role in political communication and has 'become a medium for talking and fighting about politics, organizing collective action, and showing support for, or critique of politicians and political issues (Jungherr, 2015)'. So Twitter is used for predicting the outcome of elections or as a communication platform during political protests (Gayo-Avello, 2012; Larsson & Moe, 2012; Mueller & van Huellen, 2012). Therefore, Twitter and its potential, especially for foresight, will be examined in the following.

Table 1

Overview on basic functionalities of Twitter.

<i>Tweet</i>	As a message of 140 characters, tweets can contain @-messages, links and #hashtags. The tweets can be answered and retweeted by other users.
@-message	To mention other Twitter users in a tweet, their username is tagged with @.
#hashtag	By the #-symbol, terms are tagged and connected with tweets using that same term.
<i>Retweet</i>	By retweeting a message, it is forwarded to the user's followers and can be shared within its network.
<i>Follower</i>	A follower <i>follows</i> other users on Twitter and thereby subscribe to the tweets of other users. Follower networks can be built up.

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