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Evaluating the Impact of Posted Advertisements on Content Sharing Sites: an Unsupervised Social Computing Approach

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Abstract

During the last decade social media have greatly flourished, reaching rapidly the amazing figures of today. According to the Search Engine Journal (http://www.searchenginejournal.com/25-insane-social-media-facts/79645/): (a) currently 684,478 pieces of content are shared on Facebook every minute, (b) people are spending 1 out of every 7 minutes on Facebook when online, (c) 93% of marketers are using social media, however, only 9% of marketing companies have full-time bloggers and (d) around 46% of web users will look towards social media when making a purchase. It is obvious that businesses are tapping into social media, since they find them as a rich source of information and a business execution platform for product design and innovation, consumer and stakeholder relations management, and marketing. For this reason it is very useful to evaluate the impact of each posted advertisement. Towards this direction several supervised works have been presented in literature mainly focusing on traditional media. However, the impact of advertisements on new media (such as social networks, blogs etc.) has not been studied thoroughly yet. Additionally unsupervised impact evaluation is a very challenging problem. In this paper a novel unsupervised social computing approach is proposed that effectively performs both on open social media (twitter, blogs, microblogs etc) and on rule-stringent media (e.g. Facebook, LinkedIn etc). Our scheme algorithmically estimates the importance of each advertisement by considering both explicit interactions between advertisements and social media users and users' popularity. The proposed method operates without human intervention and training and it is applied on real content posted on social media. Experimental results provide an insight of the performance of our system and specific areas are detected for future research.

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Keywords: advertisements' impact ; social media; social computing; user popularity;

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1. Introduction

The world in which marketing operates has fundamentally changed. The rise of China, India and other emerging economies has demanded new market strategies to reach developing countries. At the same time, social concerns from environmental impact to corporate social responsibility are changing the relationships of companies to the societies in which they operate. Social Media and virtual worlds such as Second Life are giving new meaning to the concept of "place" in marketing. Collaborative projects such as open source software and Wikipedia are transforming the consumer into a co-creator.

On the other hand, the ever growing amount of user generated content and active participation over social media have recently attracted considerable public and scientific interest. Several studies estimate that the time spent on social networking websites is 20-25% of the total time spent on the internet, while more than 50% of social media users follow brands on social media (Van Belleghem et. al., 2011). A significant portion of this social media usage is critical for businesses to listen, monitor and respond. There exist many forums, blogs, news-sites and message-boards where customers express their opinions, complaints, questions, suggestions etc. regarding products and services. Businesses are increasingly becoming aware of this trend and devising strategies to best make use of this social media channel. It is now common to see 'pages' of various businesses on commonly used social networking websites. These pages are used by companies to make announcements and get feedback from customers about their products or services. Customers themselves use these brand pages for availing discounts, read reviews, access information, submit opinion etc. In some cases, companies (customers) are also using these pages for providing (accessing) customer service. Since the nature of brand page usage varies across 'authors' of user generated content, it is desirable for businesses to be able to prioritize the content for listening and responding.

Towards this direction, companies are increasingly investing in social media, indicated by worldwide marketing spending on social networking sites of about $4.3 billion (Williamson, 2011). One way to realize this aim is to create brand communities in the form of brand fan pages on social networking sites where customers can interact with a company by liking or commenting on brand posts (McAlexander et. al., 2002). Consumers who become fans of these brand fan pages tend to be loyal and committed to the company, and are more open to receiving information about the brand (Bagozzi and Dholakia, 2006). Moreover, brand fans tend to visit the store more, generate more positive word-of-mouth, and are more emotionally attached to the brand than non-brand fans (Dholakia and Durham, 2010). While preliminary research has been conducted on the success of marketing activities on social media, little is known about factors that influence brand post popularity, that is, the number of likes and comments on brand posts at brand fan pages (Ryan and Zabin, 2010). Management-oriented studies about brand post popularity are mainly descriptive; they provide no theoretical foundation and do not formally test which activities actually improve brand post popularity. For example, these studies suggest that companies should experiment with different brand post characteristics, such as videos, images, text, or questions (Keath et al. 2011). Current insights are thus limited, which has increased the call for research in the area of social media.

In this paper a novel unsupervised social computing approach is proposed, aiming at algorithmically estimating the importance of advertisements posted on social networks. To do so, first of all explicit interactions between advertisements and social media users are considered (systematic analysis of likes, comments and sharings). Additionally users' popularity is also taken into consideration, since a popular user may exercise more influence to people around his/her micro-world than a non-popular user. The proposed scheme effectively performs both on open social media (twitter, blogs, microblogs etc) and on rule-stringent ones (e.g. Facebook, LinkedIn etc) and does not require human intervention and/or training. Experimental results over real social media advertisements provide insights of our system and specific areas are detected for future research.

The rest of this paper is organized as follows: Section 2 focuses on related works. The proposed scheme is described in Section 3. Experimental results are provided in Section 4 while Section 5 concludes this paper.

2. Related Work

Brand communities were found to be a successful tool for increasing sales (Adjei at al., 2010). In addition, they have the potential of improving the relationship between the consumers and the brand (Sicilia and Palazon, 2008) and may influence members' perceptions and actions (Muniz and Schau, 2007). Brand communities facilitate