



Discovering interest groups for marketing in virtual communities: An integrated approach [☆]

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ABSTRACT

Using mature computing technologies, firms are able to obtain consumer network data more easily now than ever before. Although marketers are interested in social networks for WOM marketing, they previously ignored the importance of understanding network structures (Van den Bulte & Wuyts, 2007). Therefore, this research proposes an integrated approach – the social network analysis (SNA) and web mining techniques – through which marketers can discover interest groups in virtual communities. This research demonstrates how a framework utilized within social networks can be used to construct a recommendation system and provide an example of social network marketing applications. The proposed method makes contributions to marketing research methods in terms of data collection and analysis. The integrated approach is a good fit by which to analyze social network data in virtual communities. This research offers managerial applications and implications by which marketers can effectively reach and communicate with consumers in virtual communities.

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1. Introduction

Due to the highly fragmented mass media in today's society, reaching consumers by using traditional marketing strategies is increasingly difficult in business-to-consumer (B2C) marketing settings (Preston, 2000). Thus, marketers have experienced difficulty reaching their consumers via print advertising and TV commercials. However, the rapid growth of the user population on the Internet and Web 2.0, emphasizing two-way communication between users, has attracted marketers' attention and interest. Particularly, social networking sites (SNSs) have become very popular and attract an increasing number of users. According to a report by eMarketer (2007), 37% of adults and 70% of teenagers in the U.S. use SNSs. These numbers are projected to increase to 50% of adults and 84% of teenagers by 2011.

The SNSs have become new resources and platforms for marketing due to an increase in user popularity. Word-of-mouth (WOM) marketing in virtual communities is much more influential in terms of speed and scope than ever before as information is transmitted instantly around the globe for virtually free (Godes et al., 2005).

Marketers appreciate the importance of social networks, particularly in regard to promoting new products (Algesheimer, Dholakia, & Hermann, 2005). They expect that WOM marketing activities will succeed on consumer social networks. However, over the past few decades, the understanding and application of social networks in academia and practice have been limited and made little progress (Van den Bulte & Wuyts, 2007). In particular, evidence has indicated that marketers often ignore network structures when applying such marketing strategies (Van den Bulte & Wuyts, 2007). That is, marketers have made little effort to understand the characteristics of a network (e.g., density) or the relationship patterns between the members of such a network (Wasserman & Faust, 1994). While large amounts of social network data have been aggregated and stored by firms, this valuable data has not been well used (Garton, Haythornthwaite, & Wellman, 1997). This problem brings about fundamental and important questions, including: What should marketers know about the application of social networks in the new computing technology era? How should they combine the features of SNSs with traditional business models in order to reach consumers more effectively (Garton et al., 1997)?

During the past decade, marketing researchers have begun to examine the impact of virtual communities on consumer behavior (e.g., Algesheimer et al., 2005) and have developed the method of netnography based on ethnographic research techniques in order to better understand consumers' social networks in the virtual world (Kozinets, de Valck, Wojnicki, & Wilner, 2010). For example, using a qualitative approach, Kozinets et al. (2010) focus on how WOM

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marketing campaigns engaged consumers in regard to generating WOM advertising in personal blogs and demonstrating communication strategies. Some marketing researchers have demonstrated the ways by which to apply network analyses in order to understand switching (Iacobucci, Henderson, Marcati, & Chang, 1996), WOM referral (Brown & Reingen, 1987), organizational buying (Ronchetto, Hutt, & Reingen, 1989), and buying centers' coalition formation (Iacobucci & Hopkins, 1992). However, few marketing studies have updated the research methodologies to meet marketers' needs in regard to rapidly changing computing technologies and marketing environments. Therefore, more attention should be paid to methodology issues regarding how to effectively utilize the data on SNSs for WOM marketing given that network data and advanced analysis techniques are more accessible than ever before. The research objective of this paper is to demonstrate how to use proper advanced techniques for effective marketing in virtual communities and make these techniques more accessible to marketers.

This research proposes using the techniques of social network analysis (SNA) and web mining in order to develop a framework that can identify social networks in virtual communities. The SNA is an essential tool by which to study the structure of social networks and web mining is the most suitable technique by which to analyze web content. Further, this research empirically demonstrates how a framework for discovering social networks can be used to construct a recommendation system and provide an example of social network marketing applications. This recommendation system would be innovative as it is different from other systems that are based on traditional approaches (content-based and collaborative filtering) that many online stores (e.g., www.amazon.com) have adopted. This research offers managerial applications and implications that will help marketers to reach and communicate with consumers in virtual communities.

2. Literature review

2.1. Social networks and word-of-mouth (WOM) marketing in virtual communities

Social networks refer to composites of a large number of individuals in groups and the interactions and relationships that exist among the groups and individuals (Iacobucci & Hopkins, 1992). Marketers rely on social networks to spread marketing messages in both business-to-business (B2B) (Bianchi & Ostale, 2006; Mouzas, 2006) and B2C (Brown & Reingen, 1987) markets. Individuals in social networks act as WOM channels (Ryu & Han, 2009) and disseminate and exchange information (Brown & Reingen, 1987). Social networks influence consumer behavior in various aspects, such as information search strategies, decision-making processes and consumption decisions (Flynn, Goldsmith, & Eastman, 1996). Therefore, social networks are extremely important for WOM marketing.

During the past decade, advanced computing technologies (e.g., Web 2.0) have brought people to virtual communities, which can be defined as groups of computer users who provide friendship, social resources, information and belongingness to each other. A SNS (e.g., Facebook) is an example of a virtual community. Information exchanges in these virtual communities have become increasingly easier and quicker. As such, an increasingly influential role in regard to networks for WOM marketing in virtual communities can be expected. Many companies believe that virtual communities are valuable knowledge management systems and, therefore, are attempting to manage and collaborate with SNSs (Hsu, Ju, Yen, & Chang, 2007).

According to recent research conducted by PQ Media (2009), firms spent more than \$1.54 billion on WOM marketing in 2008, and estimates show that these expenses will increase to \$3 billion by 2013. Research further indicates that spending in WOM online communities increased by 26.6% in 2008 to \$119 million (PQ Media, 2009).

Given such a substantial allocation for WOM marketing, firms have to ensure that they are executing WOM marketing campaigns effectively in order to gain the best return on their investment. As Van den Bulte and Wuyts (2007, p. 3) state, "Like financiers, scientists and entrepreneurs, marketers have long recognized the importance of social networks, but to a more limited extent." They further indicate that marketers have focused on the role of opinion leadership and contagion processes in new product diffusion and adoption. However, the structures of social networks are often overlooked when executing marketing strategies (Van den Bulte & Wuyts, 2007). The findings of recent research in social networks and WOM contradict the commonly accepted notion that WOM influence comes from elite, highly-connected few (Smith, Coyle, Lightfoot, & Scott, 2007). Instead, those who are moderately-connected are as willing as those who are highly-connected in regard to sharing marketing messages with others. If the observed effects are true, then understanding the social network structure and the relationship strengths between members becomes important as nearly every individual within the network could potentially spread marketing messages.

2.2. Social network analysis (SNA)

The SNA was originally utilized in sociological research in various aspects, including traditional concerns of family and community structure and group dynamics, social stratification and health and welfare provisions in regard to the global economy (Scott, 2002). One of its appealing features is that the SNA allows researchers to identify relationships among social entities (Wasserman & Faust, 1994). The SNA can also find clusters and identify roles and positions of entities in a network. Thus, the SNA helps researchers to understand the patterns of relationships among consumers and identify opinion leaders and information transmission patterns in a network. As such, the SNA facilitates the ability of marketers to develop more effective marketing strategies. Marketing researchers have applied the SNA to understanding consumer behaviors, such as switching (Iacobucci et al., 1996) and WOM referrals (Brown & Reingen, 1987). Recently, the SNA has been used in regard to issues related to information science and social networks due to the development of information techniques and requirements of data processing.

The SNA was developed in order to understand the relationship between "actors," who can be described as a person, an organization or an event (Borgatti, Everett, & Freeman, 2007). In a social network, each actor is presented as a node and each pair of nodes can be connected using lines to show relationships. The network structure graph is a graph formed by these lines and nodes and the SNA is the methodology used to understand the graph and the relationships between the actors in the social network (Borgatti et al., 2007). Three important elements exist within a social network: actors, ties and relationships (Scott, 2002). The actors are the essential elements as they are the people, organizations or events being studied. The ties are used in order to construct the relationships between the actors by using a mean of path in order to establish the relationship. The ties can be divided into strong and weak ties according to the strength of the relationships and are useful when attempting to discover subgroups in a network. Different relationships may cause the network to reflect different characteristics (Hanneman, 2001).

This research proposes using the SNA and web mining in order to discover social networks in virtual communities. In order to understand the network structure as well as the relationships and behaviors of a social network, then the use of a SNA is essential and important. The SNA can uncover the structure of a social network by aggregating its members into subgroups based on their relationship patterns (Wasserman & Faust, 1994). Thus, this research used the SNA to identify social networks. Further, analysis targets were exclusively taken from the web and included such things as the

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