A Novel Recommendation System for Dental Services Based on Online Word-of-Mouth

Wen-Chin Hsu, National Central University, Jhongli City, Taiwan
Li-Chuan Chen, National Central University, Jhongli City, Taiwan

ABSTRACT

Electronic word of mouth (eWoM) is one of the most valuable resources available to consumers in the search for products and services. This paper presents a novel recommendation system in which eWoM citations compiled using search engines are filtered according to the preferences and requirements of users. The proposed mechanism uses descriptive term creation to formalize the language used in searches, which is then classified according to the Rational Decision Making model to facilitate the analysis of eWoM. The proposed system was evaluated by applying it to the search for dental services in Chungli, Taiwan. Experiment results show that the proposed system reduces the time and effort required to sift through search results. Participants reported that the proposed system excels in quality and effectiveness and had a positive effect on their satisfaction and behavioral intentions. From a managerial perspective, the proposed system provides a valuable tool with which to improve service quality by identifying areas in which previous users have provided negative commentary via eWoM.

KEYWORDS
Dental Services, Recommendation System, Word-of-Mouth

1. INTRODUCTION

Electronic word of mouth (eWoM) is a crucial factor in the purchasing decisions of consumers (Cheung & Lee, 2012). Rapid increases in the quantity of shared information on the internet (approximately 4.4 Zettabyte in 2013) (Turner, Gantz, Reinsel, & Minton, 2014), greatly hinders the search for necessary information, which has led many individuals to develop selective reading habits (Aljukhadar, Senecal, & Daoust, 2012). Studies have demonstrated that many people read only the first five pages of search results (Cacheda & Vina, 2001), which means that the vast majority of businesses are underrepresented in search results. It has been shown that enabling a computer to filter eWoM could help consumers to find information of the highest relevance with minimum time and effort. This notion has already been realized in systems, such as Amazon’s book suggestions, Netflix’s movie recommendations, and YouTube’s video recommendations. Moreover, the rapid development of web technologies has resulted in a variety of applications (e.g., blogs, social networks) aimed at facilitating the use of social networking to assist in obtaining healthcare. A number of health recommendation systems (HRS) have been developed to deal with issues, such as health education (Fernandez-Luque, Karlsen, & Vognild, 2009), dietary advice (Kim, Lee, Park, Lee, & Rim, 2009), medical information (Wiesner & Pfeifer, 2014), health insurance (Abbas, Bilal, Zhang, & Khan, 2015), and the selection of health professionals and facilities (e.g., www.ratemds.com). However, a review of the literature review
has revealed that there is still considerable room for improvement (Park, Kim, Choi, & Kim, 2012; Sezgin & Özkan, 2013). For example, many existing HRSs were designed as closed systems, in which recommendations are based on the analysis of content/data available only on that particular system. In cases where there are a limited number of users accessing the system, the resulting recommendations may be inappropriate or outdated. Although the availability of online health-related information and eWom has increased dramatically, it is often scattered across multiple sites (Müller, Hanbury, & Al Shorbaji, 2012). Making available all information relevant to an individual’s health concerns is crucial. This study proposes a novel eWoM-based service recommendation system for healthcare services to fill this gap. In accordance with Wilson’s model of information seeking behavior (Wilson, 2000), it would be reasonable to assume that consumers employ information obtained by word of mouth (WOM) in the selection of health care services. Nonetheless, different medical problems may prompt different information seeking behavior. For example, patients with the flu are more likely to seek online medical information whereas those with cancer are more likely to seek help directly from medical professionals (Lambert & Loiselle, 2007). The eWoM-based recommendation system developed in this study used Google Trends (www.google.com.tw/trends) for the collection of clinic recommendations from internet users in Taiwan. Dental services were identified as the medical service most commonly appearing in online searches. Thus, the proposed recommendation system (DentSearch) was evaluated by applying it to the search for dental clinics.

2. LITERATURE REVIEW

The popularity of online shopping and e-commerce has led to the growth of recommendation systems for the promotion of products as well as services (Sarwar, Karypis, Konstan, & Riedl, 2000). In the following section, we present the concepts on which recommendation systems are constructed as well as an overview of previous literature related to health recommendation systems:

1. Content-based Recommendation Systems (Content-based RS) are based on user profiles associated with preferences in the browsing and purchasing of products or services. The profile is compared with the attributes of the product in order to generate recommendations of products deemed suitable to the user (Pazzani & Billsus, 2007). For example, a music recommendation system would look through current products matching the user preferences, as indicated by previous purchasing history (e.g. genre, artist, and price). The methods used to identify links between the profile and recommendations can have a significant influence on the satisfaction of the user. These primary matching techniques include latent semantic analysis and term frequency-inverse document frequency (TF-IDF). Accuracy can be further enhanced by moving beyond the frequency of term usage by implementing a descriptive term; i.e., an organized arrangement of words and phrases (Wattenbarger, Bailey, & Martinez, 1977). System designers can pre-define keywords or phrases pertaining to products or services to facilitate the analysis of data by imposing well-conceived semantic constraints (Gray, Gray, & Ounis, 2009). Nonetheless, understanding the preferences of users is key to determining the success of the recommendation system. For example, e-shopping platforms, such as Amazon, typically employ two methods in the observation of user preferences. The first is an implicit approach involving analysis of browsing or purchasing records for a given period of time. Unfortunately, the effectiveness of this approach dwindles with the passage of time since the last transaction. The second is an explicit approach, in which users are asked directly about their preferences, using devices such as questionnaires. This approach tends to be more accurate; however, many users find this approach inconvenient
The Expert’s Opinion
[www.igi-global.com/article/expert-opinion/51013?camid=4v1a](www.igi-global.com/article/expert-opinion/51013?camid=4v1a)

Web-Based Surveys in China
[www.igi-global.com/chapter/web-based-surveys-china/20620?camid=4v1a](www.igi-global.com/chapter/web-based-surveys-china/20620?camid=4v1a)