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EXTRACTING CUSTOMER INTELLIGENCE BY SOCIAL MEDIA DIALOG MINING: AN ONTOLOGY-BASED APPROACH FOR CUSTOMER EXPERIENCE ANALYSIS.

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EXTENDED ABSTRACT

Research Questions

Today's companies commonly employ social media channels, such as Facebook, Twitter, as an interaction platform for customer service (Zeng et al. 2010). Simultaneously, companies collect customer data from social media to listen, monitor, and analyze as this data contains valuable customer opinions about products and services, helping companies to improve customer satisfaction (Zeng et al. 2010; Alt & Wittwer 2014). Oftentimes, social media data rests on the big data context, possessing the characteristics of high volume, high variety, high velocity and high veracity (Gantz and Reinsel, 2011). However, the diverse range of social media sites and the big data format hamper the capabilities of companies in conducting customer intelligence discovery and utilizing learnt knowledge for service improvement. This paper suggests an ontology-based approach of social media analytics, examining social dialogs between companies, customers and other users. Through the proposed method, we address the research questions: (1) How can social media insights be

captured not only from customer opinions but from social interactions? (2) How can a flexible and adaptable-to-change knowledge management system be developed? And, (3) how can companies leverage customer intelligence and further implement it within business processes/systems?

Method and Data

This paper focuses on extracting useful information from unstructured social media dialog data by an ontology method. Ontology is viewed as a semantic modeling tool of constructing, reusing and sharing domain knowledge between people or between people and machines (Lee et al. 2015). We developed a social media dialog ontology following ARC model - activity, resource, and context (proposed by Ordenes et al. 2014). Unlike customer opinion mining research centered on separate customer comments, this research uses dialog streams between a customer and a company as unit of analysis. A case study based on a UK telecoms company's Twitter platform was conducted to develop the ontology by manually coding the concepts of service activities, resources and contexts on a small sample of Twitter dialogs. The data set contained a total number of 312,529 Tweets, and 36,710 valid pieces of dialog between customers and the company were recognized. Based on the built ontology, a

text mining tool was employed to perform automatic information retrieval and customer experience modelling on the sizeable Twitter data set.

Summary of Findings

A Twitter dialog contains real-life customer experiences expounded during, or after, the service interaction. To understand the gap between services proposed by the company and customers' expectation, we examined how dynamic customer sentiment changed in the Twitter dialogs between providers and customers. We controlled the research setting as "customer app using experience" and analyzed the concept co-occurrence (service resource, activities and contexts) in four types of customer sentiment change condition: positive start—positive end (satisfaction), negative start —negative end (dissatisfaction), negative start—positive end (from dissatisfaction to satisfaction) and positive start—negative end (from satisfaction to dissatisfaction). The research findings indicate that Twitter customer subject mentions differs in these four conditions and the concept concurrency analysis reveals the service strengths and weaknesses experienced by customers. For example, in the customer satisfaction cases, the concepts "mobile transaction", "rewarding plan" are more frequently mentioned. In contrast, the app "download" and "reinstalled" are discussed in the

customer dissatisfactory experiences. Notably, the company tended to intervene in negative customer experiences as a means of service problem response. We further modelling the company's reply Tweets in negative customer experiences and the findings identify important rules the company used to recover customer satisfaction in negative service experiences.

Key Contributions

The proposed ontology offers an approach to extract embedded customer intelligence from the unstructured social media 'big data'. This approach is of practical value as the ontology can be shared, reused and improved in future studies (Lee et al. 2015). More importantly, the ontology can be applied to conduct database design, customer knowledge management and database marketing implementation (Pinto et al., 2009). This could help service providers to effectively capture customer intelligence and apply it to service process improvement agilely, which could shorten service improvement time, and even create a positive service innovation circle. Moreover, previous research highlights that customer experience is, in nature, dynamic rather than static (Verhoef et al., 2009). Through analyzing customers' changing sentiment during the service interaction, a customer's dynamic experience can be observed from

a process perspective. Although the research findings are limited to specific domain, creating difficulties in generalization, the proposed ontology suggests a data-driven approach to understand customer experience that supports better business decision making and provides a model that could be replicated in other contexts. Notably, more than customer behavioral data; the research takes companies' dialogical interaction data into account by modeling the company's actions that affect customer experiences and responses. As such, a holistic picture of service process can be obtained, enabling service providers to conduct customer journey mapping and service process blueprinting (Nenonen et al. 2007).

References are available upon request.