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SENTIMENT ATTRIBUTION ANALYSIS WITH HIERARCHICAL CLASSIFICATION AND AUTOMATIC ASPECT CATEGORIZATION ON ONLINE USER REVIEWS

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Abstract

Due to COVID-19 pandemic, most physical business transactions were pushed online. Online reviews became an excellent source for sentiment analysis to determine a customer's sentiment about a business. This insight is valuable asset for businesses, especially for tourism sector, to be harnessed for business intelligence and craft new marketing strategies. However, traditional sentiment analysis with flat classification and manual aspect categorization technique imposes challenges with non-opinionated reviews and outdated pre-defined aspect categories which limits businesses to filter relevant opinionated reviews and learn new aspects from reviews itself for aspect-based sentiment analysis. Therefore, this paper proposes sentiment attribution analysis with hierarchical classification and automatic aspect categorization to improve the social listening for diligent marketing and recommend potential business optimization to revive the business from surviving to thriving after this pandemic. Hierarchical classification is proposed using hybrid approach. While automatic aspect categorization is constructed with semantic similarity clustering and applied enhanced topic modelling on opinionated reviews. Experimental results on two real-world datasets from two different industries, Airline and Hotel, shows that the sentiment analysis with hierarchical classification outperforms the classification accuracy with a good F1-score compared to baseline papers. Automatic aspect categorization was found to be able to unhide the sentiment of the aspects which was not recognized in manual aspect categorization. Although it is accepted that the effectiveness of aspect-based sentiment analysis on flat classification and manual aspect categorization, none have assessed the effectiveness while using hierarchical classification with a hybrid approach and automatic aspect categorization.

Keywords

Author Keywords: Sentiment Analysis; Online User Reviews; Hierarchical Classification; Automatic Aspect Categorization; Topic Modelling; Topic Cluster Labelling; Business Optimization

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