

ABSTRACT

The rapid growth of social media usage has made user opinions toward Online Travel Agency (OTA) services an important data source for understanding consumer perception and emotional dynamics. This study aims to integrate ontology-based sentiment analysis with Social Network Analysis (SNA) to gain a more comprehensive understanding of emotional responses and user interaction structures related to OTA services (Traveloka, Tiket.com, and Agoda) on the X platform.

User emotions were manually annotated based on Ekman's basic emotion theory (*joy, anger, sadness, fear, disgust, surprise*) and mapped to service aspects using a domain-specific ontology developed for OTAs. The ontology serves as a conceptual framework to contextualize user complaints and appreciation. Meanwhile, SNA is employed to analyze the structure of user interaction networks and identify key actors. The study combines *centrality* metrics and user *engagement* (likes, *retweets*, replies, quotes) using a Multi-Criteria Decision Making (MCDM) approach based on *Entropy-Weighted TOPSIS*, yielding objective influence scores.

The results indicate that Traveloka is dominated by positive emotions (joy), while Tiket.com has a balanced proportion of joy and anger. Agoda is dominated by negative emotions (anger and sadness), especially regarding refund issues, customer service responses, and system disruptions. The Bi-LSTM model showed high performance on the joy label, but experienced a decrease in accuracy for minority emotions such as surprise and disgust. Furthermore, SNA integration allows the identification of users with high influence based on the emotions conveyed and their connectedness in the social network. These findings can be used as a basis for strategic decision-making by OTA service providers in improving service quality and reputation management.

Keywords: Online Travel Agency, emotion analysis, Bi-LSTM, ontology, Social Network Analysis, TOPSIS, influence score