# D3Advert: Data-Driven Decision Making for Ad Personalization through Personality Analysis Using BiLSTM Network

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**Abstract :** Personalized advertising holds greater potential for higher conversion rates compared to generic advertisements. However, its widespread application in the retail industry faces challenges due to complex implementation processes. These complexities impede the swift adoption of personalized advertisement on a large scale. Personalized advertisement, being a data-driven approach, necessitates consumer-related data, adding to its complexity. This paper introduces an innovative data-driven decision-making framework, D3Advert, which personalizes advertisements by analyzing personalities using a BiLSTM network. The framework utilizes the Myers–Briggs Type Indicator (MBTI) dataset for development. The employed BiLSTM network, specifically designed and optimized for D3Advert, classifies user personalities into one of the sixteen MBTI categories based on their social media posts. The classification accuracy is 86.42%, with precision, recall, and F1-Score values of 85.11%, 84.14%, and 83.89%, respectively. The D3Advert framework personalizes advertisements based on these personality classifications. Experimental implementation and performance analysis of D3Advert demonstrate a 40% improvement in impressions. D3Advert's innovative and straightforward approach has the potential to transform personalized advertising and foster widespread personalized advertisement adoption in marketing.

**Keywords :** personalized advertisement, deep Learning, MBTI dataset, BiLSTM network, NLP.

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