1. Introduction

The development of technology today has grown rapidly, including social media, such as Twitter. Twitter, now renamed X, is a popular platform for sharing opinions about culinary tourism. X plays an important role in providing reviews to recommend culinary tours. In fact, Twitter is the most popular and widely used social microblogging service, with over 336 million active users and more than 500 million daily tweets [1]. Millions of global Twitter users discuss food, expressing opinions and preferences. This leads to an overabundance of recommendation information. The abundance of information makes it difficult for users to determine their desires, so a culinary tourism recommender system is needed. Recommender systems help overcome information overload by providing recommendations according to user criteria to facilitate selection [2].

The recommender system has several methods: content-based, collaborative filtering, and hybrid-based [3]. This research proposes the Content-Based Filtering (CBF) method, which predicts the relationship of an item with other items based on existing content, depending on the content assessed by the user [4], [5]. CBF methods also have the ability to provide more personalized recommendations [3], [6]. To improve system performance, the recommender system is combined with the Bidirectional Long Short-Term Memory (Bi-LSTM) method. Bi-LSTM is a combination of deep learning methods consisting of two LSTM layers [7], [8]. Thus, Bi-LSTM is a development that allows additional training by traversing the input data twice, from left to right and from right to left [8]. Bi-LSTM consists of two LSTMs that process data forward and backward, allowing the model to combine information from the past and future. By integrating both outputs, the Bi-LSTM can provide better prediction performance than models with one-way LSTMs only [7]. This research aims to effectively apply the CBF and Bi-LSTM methods to provide recommendations for culinary tourism with a dataset of tweets in X, especially culinary tourism in Bandung, Indonesia.

Previous research has proposed a content-based movie recommender system that uses initial attributes such as genre, director, keywords, and movie description from IMDb and TMDb datasets [9]. The model integrates deep learning to predict the multi-class popularity of movies with an accuracy reaching 96.8%, exceeding all benchmark models. This research highlights the potential of predictive and prescriptive data analysis to support movie industry decisions. Another study used Word2Vec in a deep learning approach to extend features in a cyberbullying detection system on Twitter. The model achieved an accuracy of about 79%, showing improvement in the identification of harmful content such as cyberbullying on the platform [10].

The research proposed the Bi-LSTM method for text classification with the highest accuracy of 0.9141 and F1 score of 0.9018. This model shows superior performance compared to other models, especially in handling data loss and long-term dependency problems on large datasets. Although it requires more data and training time, Bi-LSTM is effective in sentiment analysis and modern text classification [11]. In addition, Bi-LSTM can be used in the development of recommender systems using the Passer approach. Feature fusion was applied before classification, and the Passer-Local technique adjusted parameters for product recommendation. The model achieved F1 scores between 88.58% to 92.51%, showing significant improvements in product recommendation accuracy and consistency over previous techniques [12].

This research proposes developing a recommender system for culinary tourism in Bandung by combining CBF and utilizing Word2Vec and Bi-LSTM. To the best of our knowledge, no research has utilized Word2Vec's ability to embed words in CBF or use Bi-LSTM as classification. The combination of Word2Vec and Bi-LSTM is performed because Word2Vec is able to generate word representations that strengthen personalization in Content-Based Filtering (CBF), while Bi-LSTM is effective in handling long-term dependency on sequence data, resulting in more accurate and relevant recommendation predictions. The integration of the two allows the system to provide more personalized culinary recommendations that match the user's preferences. This research aims to get the best accuracy value and provide recommendations for culinary tourism that match user preferences.