

1. INTRODUCTION

Today's rapid technological development is followed by an increase in the number of information circulating on the Internet. With the amount of information circulating too abundantly, finding the right information quickly and getting satisfactory results becomes increasingly difficult for users [1]. This also happens when searching for information such as books [2], various online book provider service websites such as Amazon, Goodreads, Gramedia, and others provide books with different types and choices. As a result, book lovers often have difficulty in determining the choice of other books to read. To overcome these problems, a system is needed that can help users find and determine book choices precisely, quickly, and of course with a system that is easy to operate.

Recommender system is a system that aims to provide the best suggestions for products and services to its users. This system provides results of items or products that are relevant to the user's interests and needs by finding patterns in the information set by learning the user's choices and behavior [3]. In building a recommender system, various methods such as hybrid filtering, collaborative filtering, and content-based filtering can be used [4]. Recommender systems have proven to be a successful solution to the problem of information overload in recent years, especially for people who do not have sufficient experience to evaluate the potential of a large number of alternative items in the services offered [5].

The recommender system built in this research uses a model-based Collaborative Filtering (CF) method with Singular Value Decomposition (SVD) technique and cosine similarity calculation to measure item similarity. SVD is a matrix factorization technique for identifying latent semantic factors in information retrieval. In its application, the factorization of the user-item evaluation matrix is required, in addition, SVD also has advantages for dealing with large dataset, extracting features, reducing noise and dimensional space in large data to speed up computation [6].

So far, there is research related to the development of recommender systems using model-based CF techniques. Sireesha, et al [7] built recommendations in the book domain using model-based CF and K-nearest neighbor to classify items. The similarity measure used in this study is the cosine distance, to obtain a set of items that are similar to the target item. The research by Christina, and Baizal [8] also discusses the development of a model-based CF recommender system using SVD technique enhanced with the Slope One algorithm. This combination addresses the problem of data sparsity, because the model is trained with more complete data as the Slope One algorithm fills in the empty rating data. Based on the test results with the MAE error metric, it shows that the recommender system built with the combination method of SVD and Slope One algorithm is better than using only one of the algorithms from this method. Pujahari, et al [9] analyzed various CF model-based recommender system techniques factorization approach in the movie domain, it was found that the SVD approach had the best training time. In this case, the computation time performance of the recommender system depends on the dimension of the user-item latent factor matrix.

In the various book recommender systems that have been developed [7,8], or that use SVD techniques in other domains such as skincare [10], e-commerce products [11], and music [12], the system does not provide intensive interaction between the system and the users. This limits users' flexibility in searching for books that suit their interests. Therefore, we propose a book recommender system that can interact in natural language through a chatbot. In the built system, books are recommended based on the preferences of other books favored by the user. One method of obtaining such information is to have a conversation with the user through a Conversational Recommender System (CRS) [13]. This system allows a more direct interaction with the user to get the needed information, similar to how users have daily conversations [14].

Our research also relates to several other studies on the topic of conversation-based recommender systems, as done by Theosaksomo, et al. [15] built a chatbot conversation recommender system that provides recommendations based on users' functional needs. The results of usability tests conducted on the chatbot get good results, the main aspects evaluated were the user experience of getting recommendations as in daily life and the ease of adding functional requirements. The development of CRS has also been carried out in the music domain by Narducci, et al. [16], a system built using content-based recommendations, provide explanatory facilities, implement critiques and adaptive strategies. Users interact with the system using different methods such as natural language, buttons, or a combination of both. The evaluation results showed that users prefer interaction modes that combine buttons and natural language. In research by, Jeffrey Dalton, et al. [17] built a chatbot-based recommender system in the movie domain using Dialogflow. The recommender system is built with a collaborative filtering method, then this chatbot can receive voice input in the interaction process. The movie recommendation results produced by this system are very accurate. Fajari and Baizal [18] also built a CRS to recommend culinary tours. Built with the Named Entity Recognition method which functions to recognize or retrieve entities such as preferences, names, ages in user input. TF-IDF and cosine similarity techniques are used to generate recommendation items.

In this research, we focus on building a chatbot using the Dialogflow framework with natural language processing that can receive user preference information and provide recommendations based on it. This chatbot-

based book recommender system is built on the Telegram platform. Then, the prediction accuracy performance of the system is evaluated using RMSE and MAE. Then, to measure the level of user satisfaction is evaluated using a questionnaire. With this system, it is expected to facilitate users in finding books according to their wishes.