

1 Introduction

The increase in car sales in Indonesia is driven by the growing demand for mobility and the public's preference for private vehicles. One of the challenges the automotive industry faces is consumer confusion due to the many car options available. In today's era, where technology is becoming increasingly widespread across various aspects of daily life, essential roles such as recommender systems provide information tailored to individual preferences [1]. As technology advances, the application of deep learning in recommender systems can enhance personalization, enabling the system to process more complex data and provide more relevant recommendations to user preferences [2].

Various studies have applied the Large Language Model (LLM) across different fields, including recommender systems. Huang et al. developed an LLM for automatic and cross-modal dental diagnosis in dentistry [3]. Taylor et al. introduced Galactica, an LLM for scientific knowledge capable of integrating and reasoning with scientific data [4]. Additionally, research on Conversational Recommender Systems (CRS) also shown significant progress, such as the work of Ayundhita et al., who developed a CRS for laptop recommenders based on functional needs [5].

Research on car recommender systems has also been growing. Boteju et al. developed a car recommender system using a Hybrid Recommender Algorithm method, combining Collaborative Filtering and Natural Language Processing to generate more personalized recommendations based on user preferences [1]. Nuanmeesri et al. implemented the SMOTE method and Random Forest to improve the accuracy of second-hand car recommender systems [6]. Meanwhile, Syril et al. used User-Based Collaborative Filtering for a car recommender system based on the user's geographical location [7]. Additionally, Suryadi et al. [21] conducted research on a car recommender system with an Ontology-based approach, showing an overall system performance evaluation and user satisfaction rate of 87.84%, as well as receiving positive feedback from users regarding their satisfaction with the recommender system.

Although various approaches have been used to develop car recommender systems, there are still areas for improvement such as limitations in personalizing information and user interaction. Therefore, this research proposes a recommender system named Carfin, which utilizes a Large Language Model (LLM) in a Conversational Recommender System (CRS). This approach allows the system to provide more relevant recommendations, better understand user needs, and offer more flexibility in the interaction between the system and the user [8] [9]. Carfin is designed to enhance the user experience through better natural language understanding and deeper personalization, helping users make more informed decisions.

This study aims to address the limitations of the Carfin car recommendation system, designed to enhance personalization and user interaction in automotive recommendations. By Integrating Large Language Model (LLM) and Conversational Recommender System (CRS), we aim to improve recommendation accuracy and create more natural interactions between users and the system. However, this study has several limitations, including its exclusive focus on car recommendations, thus not covering recommendations for other automotive products. Additionally, the testing in this study is solely conducted to evaluate the performance of the LLM approach in CRS. Nevertheless, this research is expected to improve the performance and personalization capabilities of recommender systems in the automotive domain.

This paper discusses five main interconnected topics in the development of a car recommender system based on CRS using LLM It begins with Section I Introduction, which explains the background of the increase in car sales in Indonesia and the need for a recommender system to address consumer confusion. Section II Related Work, reviews various studies related to the implementation

of LLM and CRS in recommender systems. Section III Methodology, provides detailed information on the system development, including LLM CRS implementation on recommender system, flow of system interaction, preprocessing, fine-tuning, and prompt engineering. Section IV Results and Discussion, explains the significant improvements in evaluation metrics after the fine-tuning process. The paper concludes with Section V Conclusion, which summarizes the successful development of the car recommender system and suggestions for future development.