ABSTRAK

Pradana, Sattyo Ardicta. 2026. Sistem Rekomendasi Novel Menggunakan Pendekatan *Hybrid Best Matching 25 (BM25)* dan *Matrix Factorization*. Tugas Akhir. Program Sarjana. Program Studi Teknik Informatika. Universitas Muhammadiyah Jember.

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Pada era digital, jumlah novel yang tersedia di berbagai platform digital berkembang pesat sehingga menyulitkan pembaca dalam memilih judul yang sesuai dengan minat dan preferensinya. Penelitian sistem rekomendasi bacaan umumnya masih berfokus pada buku secara umum dan menggunakan pendekatan tunggal, yaitu *content-based filtering* atau *collaborative filtering,* yang memiliki keterbatasan dalam menangani teks naratif panjang maupun permasalahan *cold-start*. Penelitian ini bertujuan menerapkan dan mengevaluasi sistem rekomendasi novel berbasis *Hybrid* yang mengombinasikan metode *Best Matching 25 (BM25)* untuk mengukur relevansi konten berdasarkan judul, *genre*, dan sinopsis, serta *Matrix Factorization* untuk memodelkan preferensi pengguna berdasarkan data *Rating*. Kedua skor digabungkan menggunakan skema *Hybrid* berbobot dengan nilai *Alpha* 0,6 setelah skor BM25 dinormalisasi menggunakan min-max normalization. Dataset yang digunakan berasal dari *Goodreads-books* dan *Goodbooks-10k,* menghasilkan 8.481 novel, 16.220 pengguna, dan 981.756 *Rating* setelah tahap *Pre-Processing*. Kinerja sistem dievaluasi menggunakan NDCG dan *Precision* pada rekomendasi Top-10. Hasil evaluasi menunjukkan nilai NDCG sebesar 0,943 dan *Precision* sebesar 0,488, dengan *runtime* 137,20 detik untuk 15.813 pengguna. Pengujian variasi *Alpha*, data split, dan *Top-N* menunjukkan bahwa *Matrix Factorization* memberikan kontribusi lebih dominan terhadap kualitas pemeringkatan, sedangkan BM25 tetap berperan dalam menjaga relevansi berbasis konten. Sistem diimplementasikan dalam bentuk *website* berbasis *Flask* sehingga pengguna dapat memperoleh rekomendasi novel secara interaktif. Meskipun BM25 masih memiliki keterbatasan dalam menangkap hubungan semantik antar kata, hasil penelitian menunjukkan bahwa pendekatan *Hybrid* BM25 dan *Matrix Factorization* mampu menghasilkan rekomendasi novel yang relevan dan efisien serta berkontribusi pada pengembangan sistem rekomendasi yang menggabungkan *information retrieval* dan *collaborative filtering.*

Kata kunci: rekomendasi novel, sistem rekomendasi *Hybrid*, *BM25*, *Matrix Factorization*, NDCG, *Precision*

ABSTRACT

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In the digital era, the number of novels available on digital platforms has grown rapidly, making it difficult for readers to choose titles that match their interests. Previous studies on reading recommender systems have generally focused on books in general and relied on a single approach, either content-based filtering or collaborative filtering, each of which has limitations in handling long narrative texts or the cold-start problem. This study aims to implement and evaluate a Hybrid Recommender system for novels that combines Best Matching 25 (BM25) to measure content relevance from title, Genre, and synopsis, and Matrix Factorization to model user preference from Rating data. The two scores are combined using a weighted Hybrid scheme with Alpha 0.6, after the BM25 score is normalized using min-max normalization so that it is comparable with the 1-5 Rating scale produced by Matrix Factorization. The dataset consists of Goodreads-books for novel content and Goodbooks-10k for user Ratings, filtered to include only novel items, resulting in 8,481 novels, 16,220 users, and 981.756 *Ratings after preprocessing. System performance was evaluated using* NDCG *and Precision on a Top-10 recommendation list. The evaluation results show that the Hybrid approach achieved an* NDCG *of 0.943 and a Precision of 0.488, with a runtime of 137,20 seconds for 15,813 users. Further testing on Alpha, data split, and Top-N variations confirmed that Matrix Factorization contributes more dominantly to ranking quality, while BM25 remains important for maintaining content-based relevance. The resulting recommender system was implemented as a Flask-based website, allowing users to obtain novel recommendations interactively. The developed system still has a limitation in its BM25-based text representation, which has not yet been able to capture deep semantic relationships between words. These findings indicate that the Hybrid BM25 and Matrix Factorization approach can produce relevant and computationally efficient novel recommendations, contributing to the development of recommender systems that combine information retrieval and collaborative filtering approaches.*

***Keywords**: novel recommendation, Hybrid Recommender system, BM25, Matrix Factorization,* NDCG, *Precision*