DYNAMIC HOTEL RECOMMENDATION SYSTEM USING NLP

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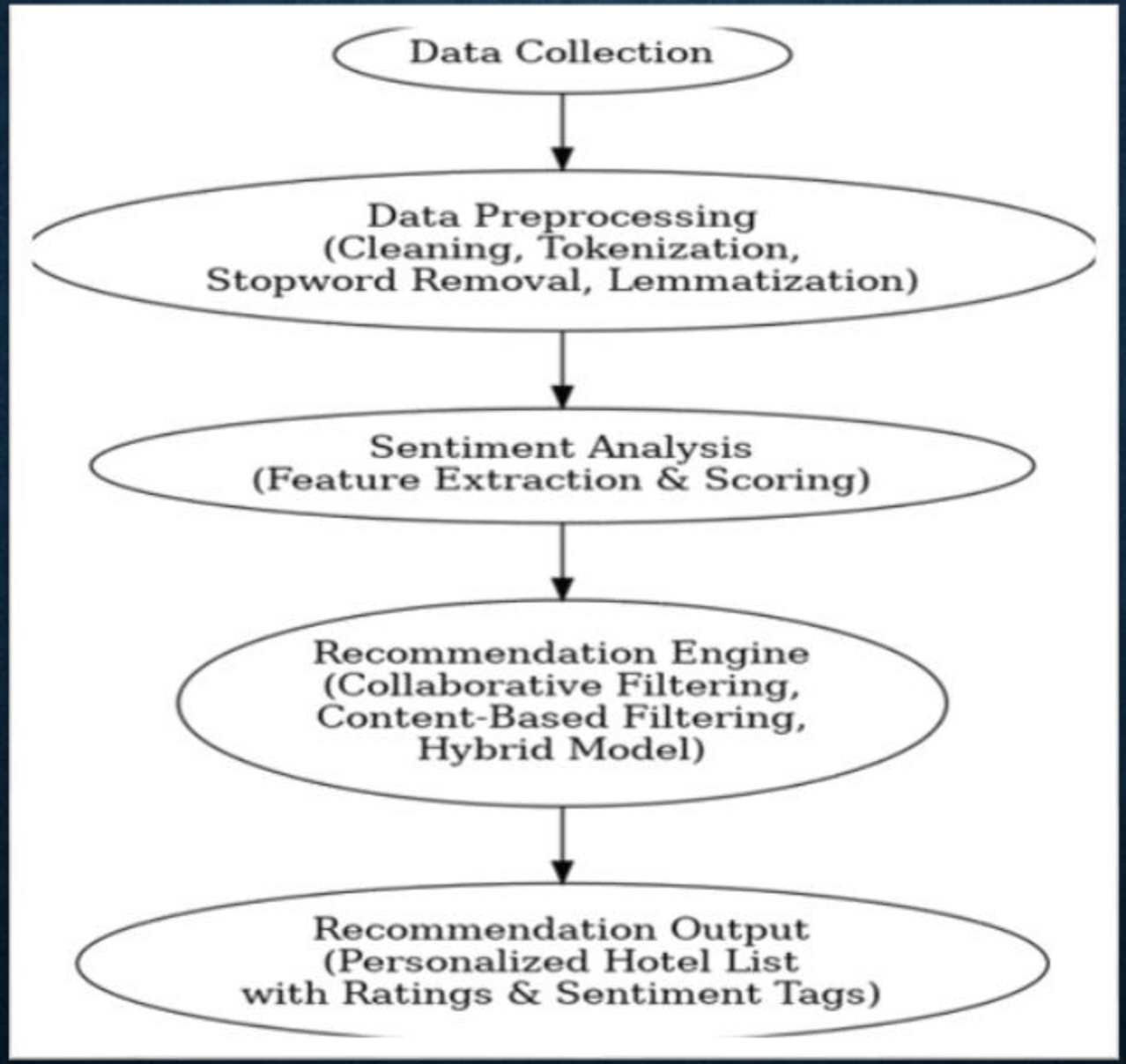
INTRODUCTION

- **Objective:** To develop an intelligent hotel recommendation system that understands user preferences and reviews using Natural Language Processing (NLP).
- **Why It Matters:**
  - Traditional hotel search methods rely on static filters and numerical ratings.
  - NLP allows for a more personalized experience by analyzing sentiment and extracting meaningful insights from reviews.
  - Aims to bridge the gap between user expectations and hotel offerings through smarter recommendations.
- **Current Stage:** Research & Initial Development

PROBLEM STATEMENT

- Finding the right hotel is challenging due to vast options and mixed reviews.
- Many recommendation systems rely on generic filters rather than true personalization.
- Our aim is to enhance hotel recommendations by analyzing user sentiment and preferences from textual reviews.


Data Collection
Data Preprocessing
(Cleaning, Tokenization,
Stopword Removal, Lemmatization)
Sentiment Analysis
(Feature Extraction & Scoring)
Recommendation Engine
(Collaborative Filtering,
Content-Based Filtering,
Hybrid Model)
Recommendation Output
(Personalized Hotel List
with Ratings & Sentiment Tags)

PROPOSED SOLUTION

- Utilize **NLP** to extract meaningful insights from customer reviews.
- Implement **sentiment analysis** to understand user opinions on different hotel aspects.
- Develop a recommendation system that adapts dynamically to user preferences.

TECHNOLOGIES & TOOLS

- **Programming Language :** Python
- **NLP :** NLTK (Natural Language Toolkit), Sentiment Analysis
- **Machine Learning :** Scikit-learn, TensorFlow
- **Database Technology :** SQL

CURRENT PROGRESS

- **Data Collection:** Aggregated hotel reviews from multiple sources.
- **Preprocessing:** Cleaning, tokenization, and stopword removal.
- **Sentiment Analysis:** Implemented initial models but need further tuning.
- **Recommendation Algorithm:** Early-stage testing of collaborative filtering and content-based filtering.

DATA PROCESSING WORKFLOW

- **Step 1:** Data collection from review platforms.
- **Step 2:** Preprocessing (cleaning, tokenization, stopword removal, lemmatization).
- **Step 3:** Sentiment analysis and feature extraction.
- **Step 4:** Applying machine learning for recommendations.
- **Step 5:** Generating and presenting recommendations to users.

NEXT STEPS & IMPROVEMENTS

- **Enhancing Feature Engineering** to improve model accuracy.
- **Testing Different Recommendation Approaches** such as hybrid models.
- **Optimizing Response Time** for near real-time results.

EXPECTED RESULTS

- A system that can **effectively analyze** user reviews and preferences.
- A more **dynamic** and **accurate** hotel recommendation system.
- Improved user experience compared to traditional filter-based recommendations.
- Scalability for larger datasets with better performance.

TIMELINE & WORK DISTRIBUTION

- **Phase 1:** Data Collection & Preprocessing (Completed)
- **Phase 2:** Sentiment Analysis Model Development (In Progress)
- **Phase 3:** Recommendation Algorithm Refinement (Upcoming)
- **Phase 4:** Final Adjustments & Optimization (Upcoming)

CONCLUSION

- The project is still in the **development and refinement phase**.
- Major work remains in **fine-tuning models, improving efficiency**.

THANK YOU