AI-Powered Social Media Suggestion System

Personalizing User Experience through Machine Learning

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INTRODUCTION

In today's digital age, users face an overwhelming amount of content, leading to decreased engagement and retention.

User Retention

Keeping users engaged amidst vast content.

Engagement

Boosting interaction with relevant content.

Content Overload

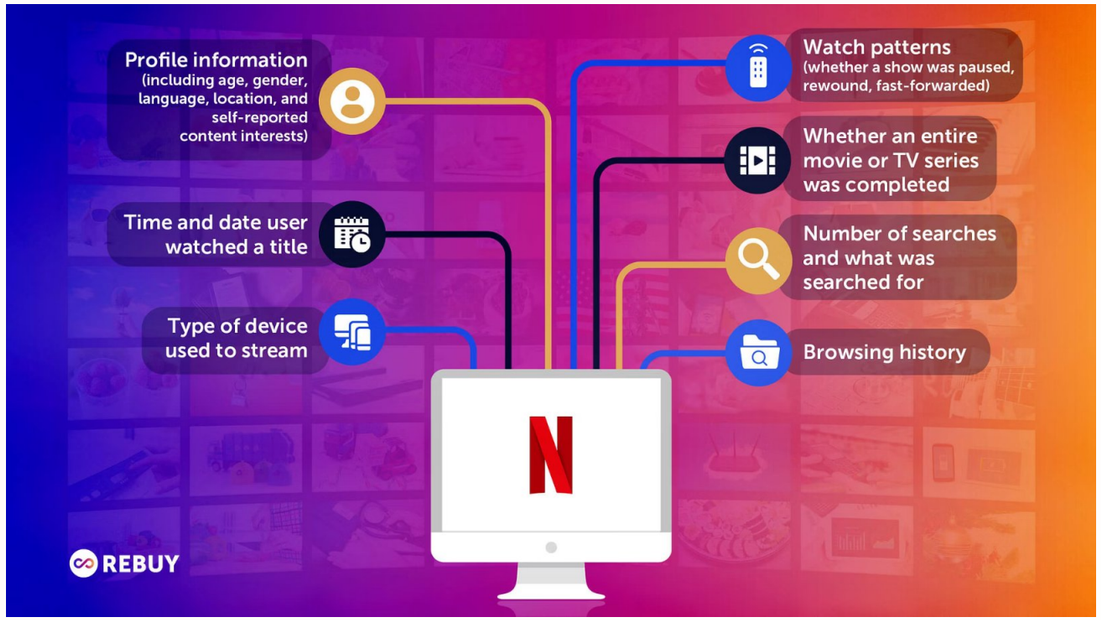
Filtering through irrelevant information.

Our goal: Recommend relevant posts, accounts, or topics using AI/ML.

Real-World Inspiration

Our system draws inspiration from successful recommendation engines across various platforms.

- Instagram Reels recommendations
- Twitter/X timeline suggestions
- LinkedIn connection & job suggestions



Inspired by Netflix and Spotify's personalized content delivery.

📄 Literature Survey (Based on IEEE Papers)

Year	Title	Methodologies / Techniques	Accuracy Achieved	Dataset Used	Limitations
2015	*A Twitter Hashtag Recommendation Model that Adopts User Interests*	User-interest modeling, topic modeling, recommendation algorithm	Reported improvements in precision/recall over baselines	Twitter dataset (hashtags & posts)	Limited dataset, no deep learning methods
2018	*A Survey of Collaborative Filtering-Based Recommender Systems* (IEEE Access)	Collaborative Filtering (CF), Content-based Filtering (CBF), Hybrid approaches, Social Graph integration	Survey (no specific accuracy value)	Various benchmark datasets (MovieLens, Yelp, etc.)	Cold-start & data sparsity remain major issues
2018	*Detecting Spam Accounts on Twitter* (ASONAM)	Supervised machine learning, feature extraction for spam/bot detection	Improved classification accuracy vs. baselines	Twitter user/account dataset	Focused on spam detection, not direct recommendation
2020	*Image Retrieval via Topic Modelling of Instagram Hashtags* (IEEE SMAP Workshop)	LDA-based topic modeling for hashtags, retrieval system	Improved retrieval quality over keyword search	Instagram hashtags/images dataset	Noise in hashtags, limited real-world evaluation

2020	*A Deep Graph Neural Network–Based Mechanism for Social Recommendations* (IEEE TII)	Deep Graph Neural Networks, high-order collaborative/social relations	Outperformed MF/NCF baselines in accuracy	Social recommendation benchmark datasets	High computation cost, privacy issues
2013	*Social Media Recommendation using ML* (IEEE, early work)	Basic ML-based recommendation (classification/regression models)	Moderate improvements over traditional baselines	Early social media datasets	Outdated (no deep learning), limited scalability
2021	*Deep Learning for Social Recommendation* (IEEE paper)	CNNs, RNNs, and hybrid DL approaches for recommendation	Higher accuracy than traditional CF methods	Public benchmark datasets (e.g., MovieLens, social datasets)	Heavy computation, limited explainability

Our Technology Stack

A robust set of tools powers our AI-driven suggestion system.

Frontend/Backend

HTML,CSS,Javascript,Python,Flask

ML Tools

pandas, NumPy, TensorFlow

Our Data & How We Use It

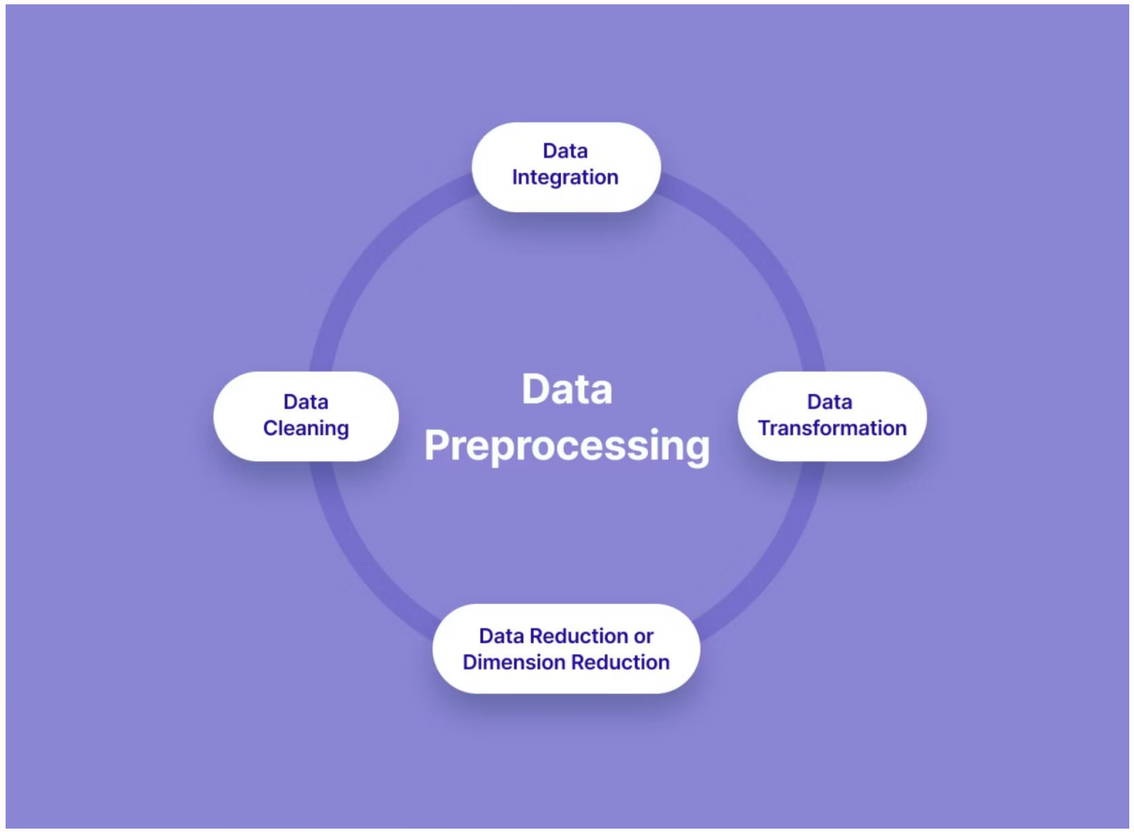
We leverage diverse data sources and meticulous preprocessing for effective recommendations.

Where the data comes from:

Public posts Twitter data, Reddit posts, or sample datasets.

What info we use/How we prepare the data:

- Post content, hashtags, likes, time
- User interests, location
- **Clean it:** Remove Unwanted text or symbols
- **Break it into parts:** Tokenise the next
- **Covert into numbers:** Use embedding so AI understands it
- **Organize it:** Combine,reduce,and format it for training



How Our System Works & Measures Success

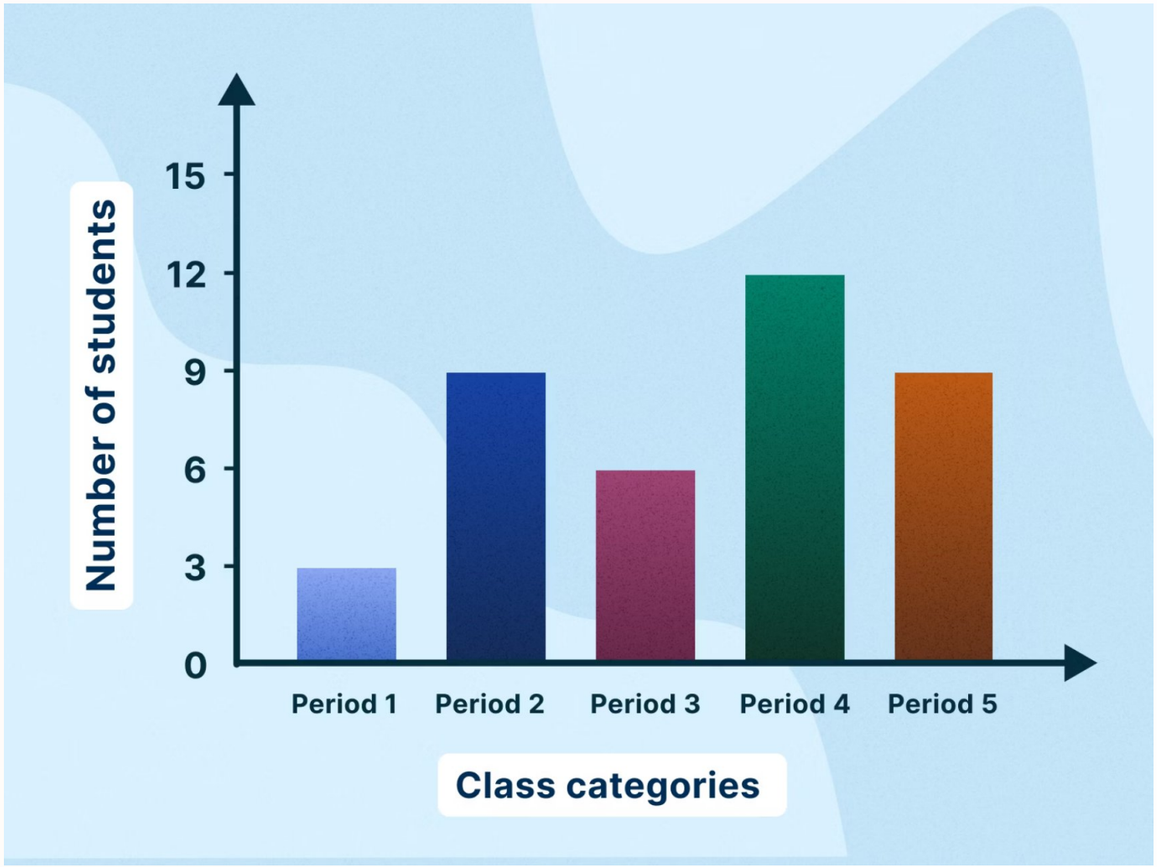
Our system delivers tailored suggestions, validated by performance metrics.

Sample Input

User likes tech, AI, short videos.

Sample Output

Suggested accounts/posts relevant to user interests.



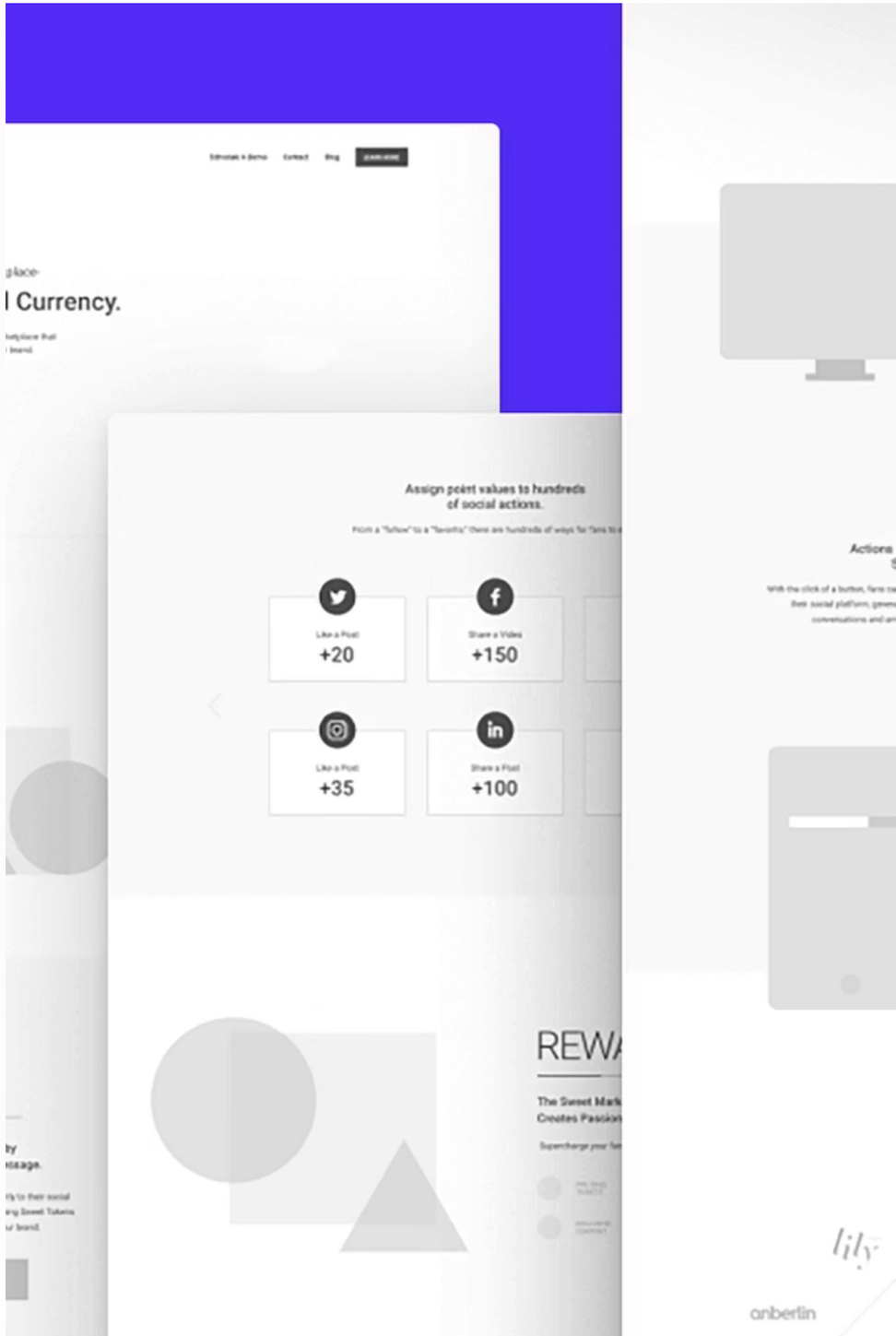
Accuracy Metrics

Evaluated using classification/regression metrics.

What the user sees:A Personalized Experience

A glimpse into the user experience:

Login —> Home Feed —> Prompt—>Recommendation Section



Learnings & Future Scope

We learned a lot while researching this project and found some areas to improve it in the future.

Challenges

- Dealing with messy or unclear data
- Suggesting content for brand-new users
- Improving the model’s accuracy and results
- Deciding between live suggestions or scheduled updates

Future Enhancements

- Add voice or emotion-based suggestions
- Use live feedback to make suggestions better over time
- Track user activity across different apps/platforms
- Avoid biased or false content in suggestions.

Conclusion

Our AI-powered system helps by showing only the most relevant and personalised content-making the user experience more engaging and meaningful.

> "Personalization is key to retaining attention in the content jungle."