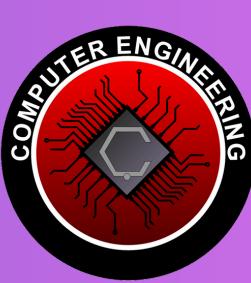


MULTIMODAL RAG-BASED PRODUCT RECOMMENDATION SYSTEM

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ABSTRACT

Our Multimodal RAG-Based Product Recommendation System integrates vision-language models with vector search and generative AI to deliver personalized fashion recommendations through text-image queries, virtual try-on capabilities, and style-aware suggestions, transforming how users discover and visualize fashion products.

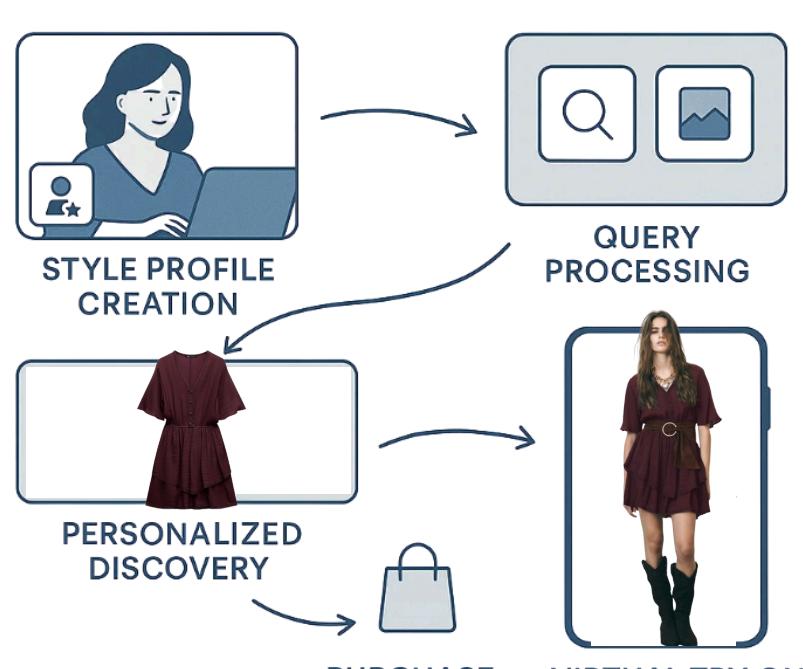


PROBLEM

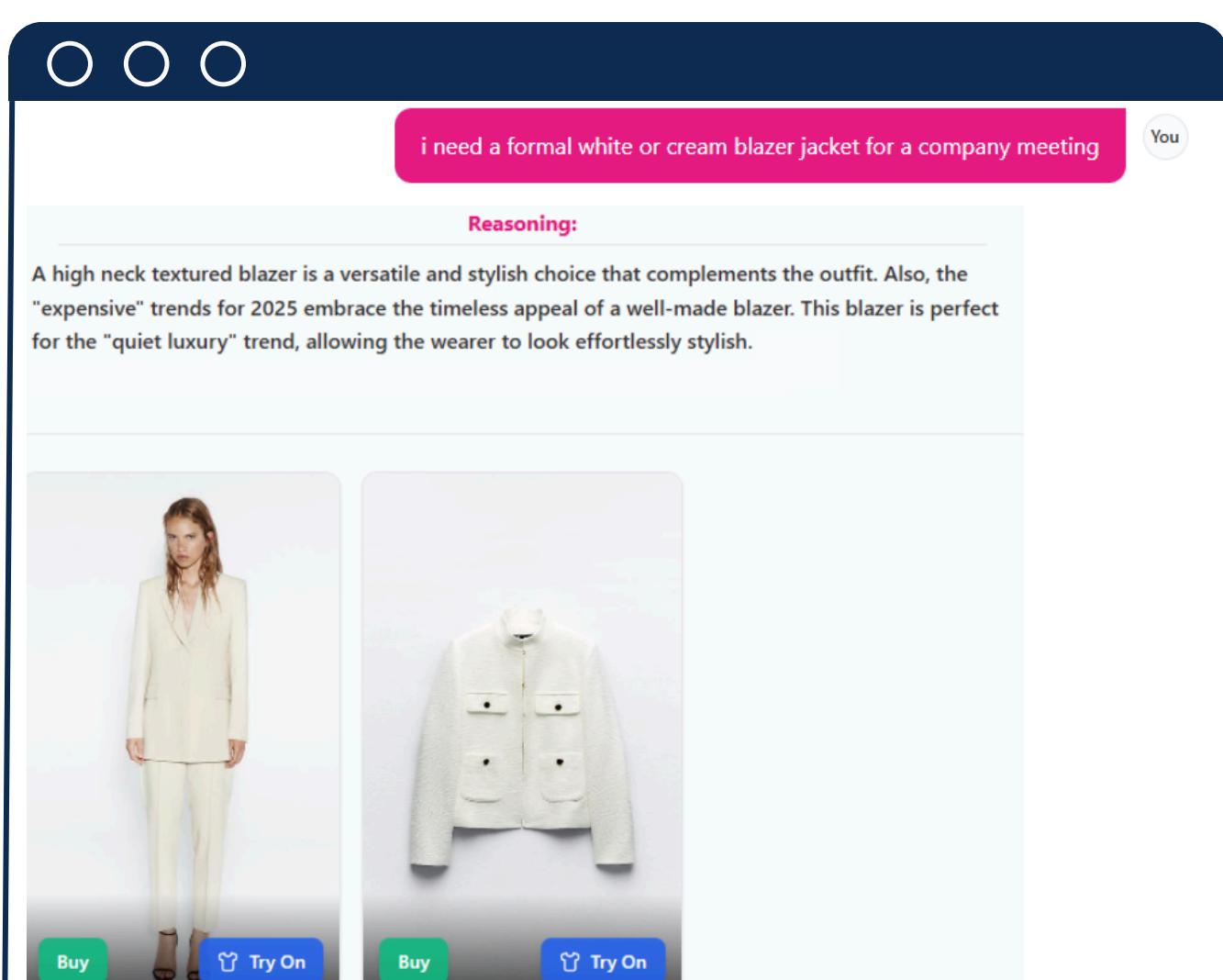
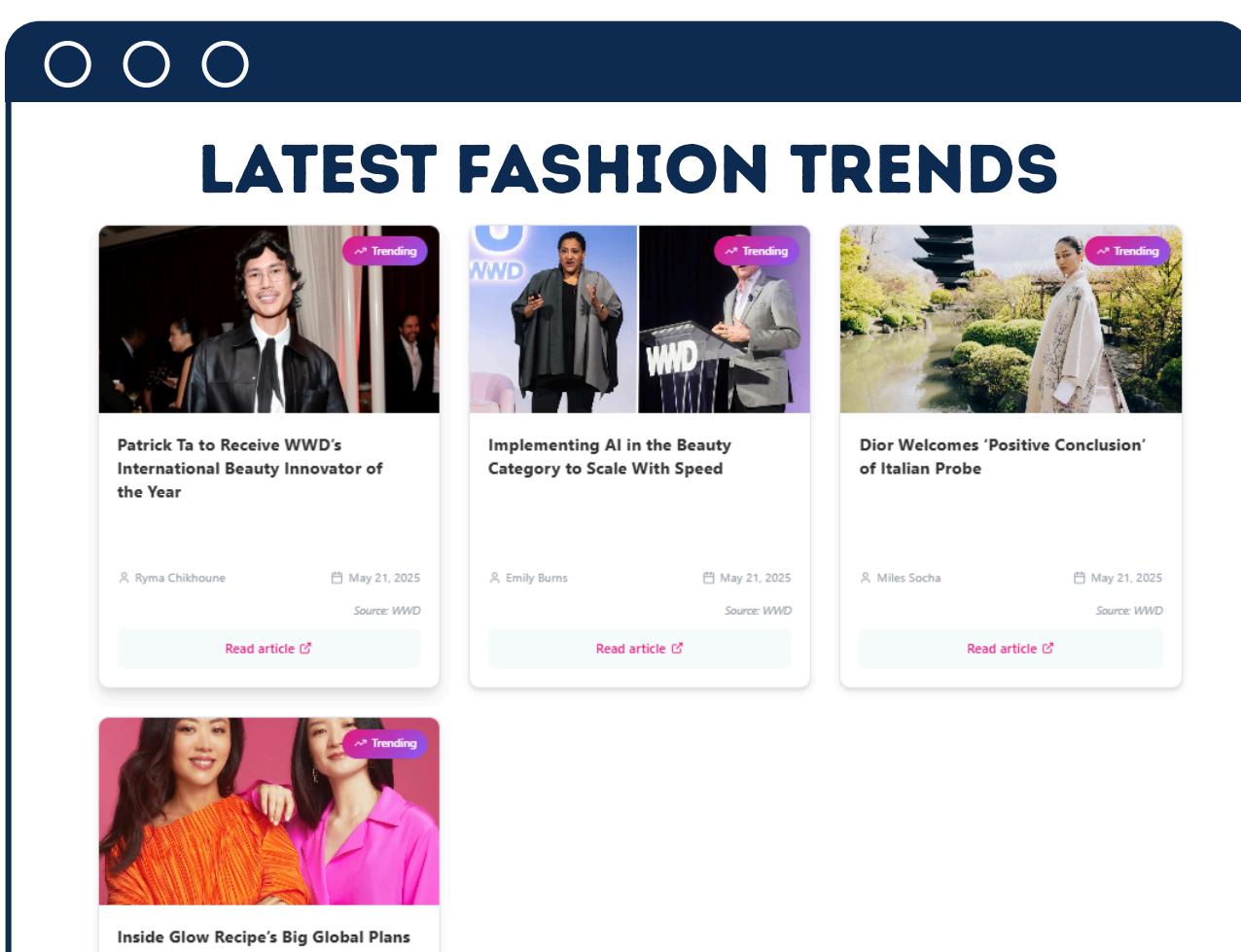
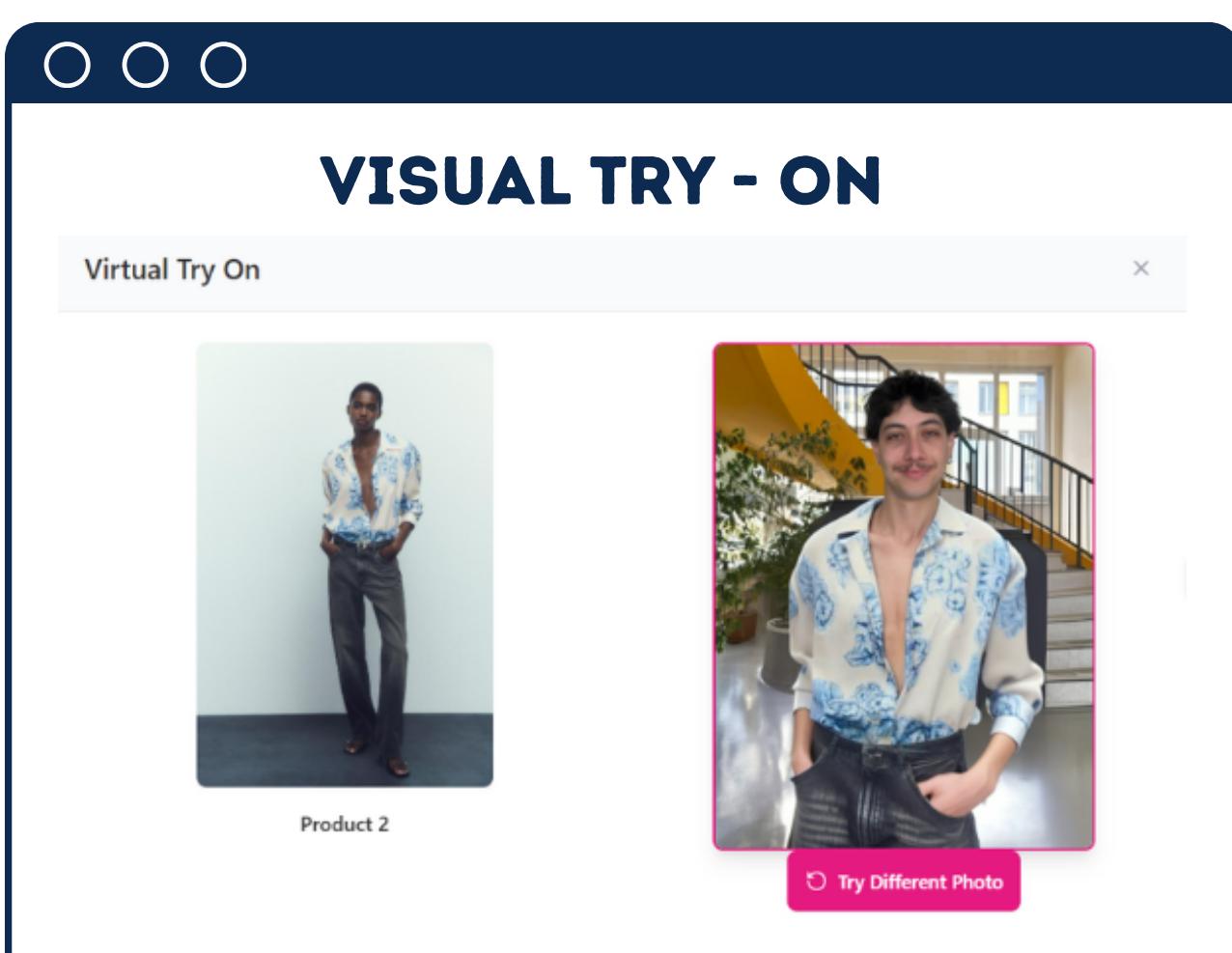
Traditional fashion search methods fail to understand the nuanced visual and contextual aspects of personal style, requiring users to navigate fragmented platforms with text-only queries that cannot adequately express style preferences or visualize how products will look on them, resulting in purchase uncertainty and style mismatches.

SOLUTION

We implemented a multi-strategy search optimization that combines collection caching, parallel multi-collection queries, contextual query analysis with keyword mapping, and adaptive search modes (focused/parallel/comprehensive) to significantly improve both speed and accuracy of the fashion recommendation system.



FEATURES



USER QUERY INPUT

(Text and/or Image)

QUERY ENHANCEMENT

- Keyword extraction
- Category mapping
- Gender/color detect

VECTOR EMBEDDING

- FashionCLIP model
- Embedding boosting

VECTOR DATABASE SEARCH

Similarity search in Qdrant

MULTI-COLLECTION PARALLEL SEARCH

- Prioritized search
- Named vectors

RESULT PROCESSING

- Score boosting
- Result diversity
- Deduplication

USER RESPONSE

Product images



Multimodal Understanding



Personalized Style Profiles



Virtual Try-On Technology



Contextual Recommendations

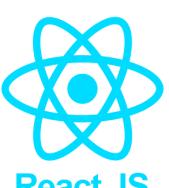
TECH STACK



Qdrant



LangChain



Google AI Studio



web development,
one drop at a time



scan here ↗

