Recommendation system

DATASET 2

Group 96

Data-aholic

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INTRODUCTION ABOUT RECOMMENDATION SYSTEM

- Helps businesses understand customer needs and preferences
- Revolutionizes the shopping experience by leveraging advanced algorithms to analyze past choices, fashion trends, and individual user preferences
- Provide users with personalized recommendations based on their unique profiles
- Saves users time

PROBLEM STATEMENT

MVP - MINIMUM VIABLE PRODUCT

ADVANTAGES

- Diversity of products and users
- Data loss
- Performance and speed
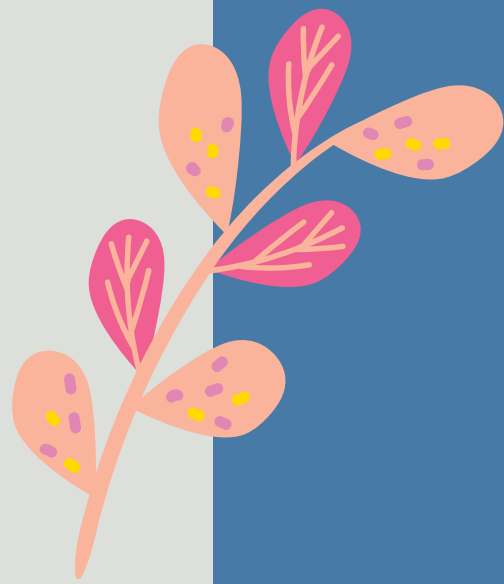- Interaction between priority components
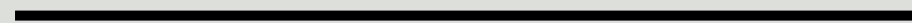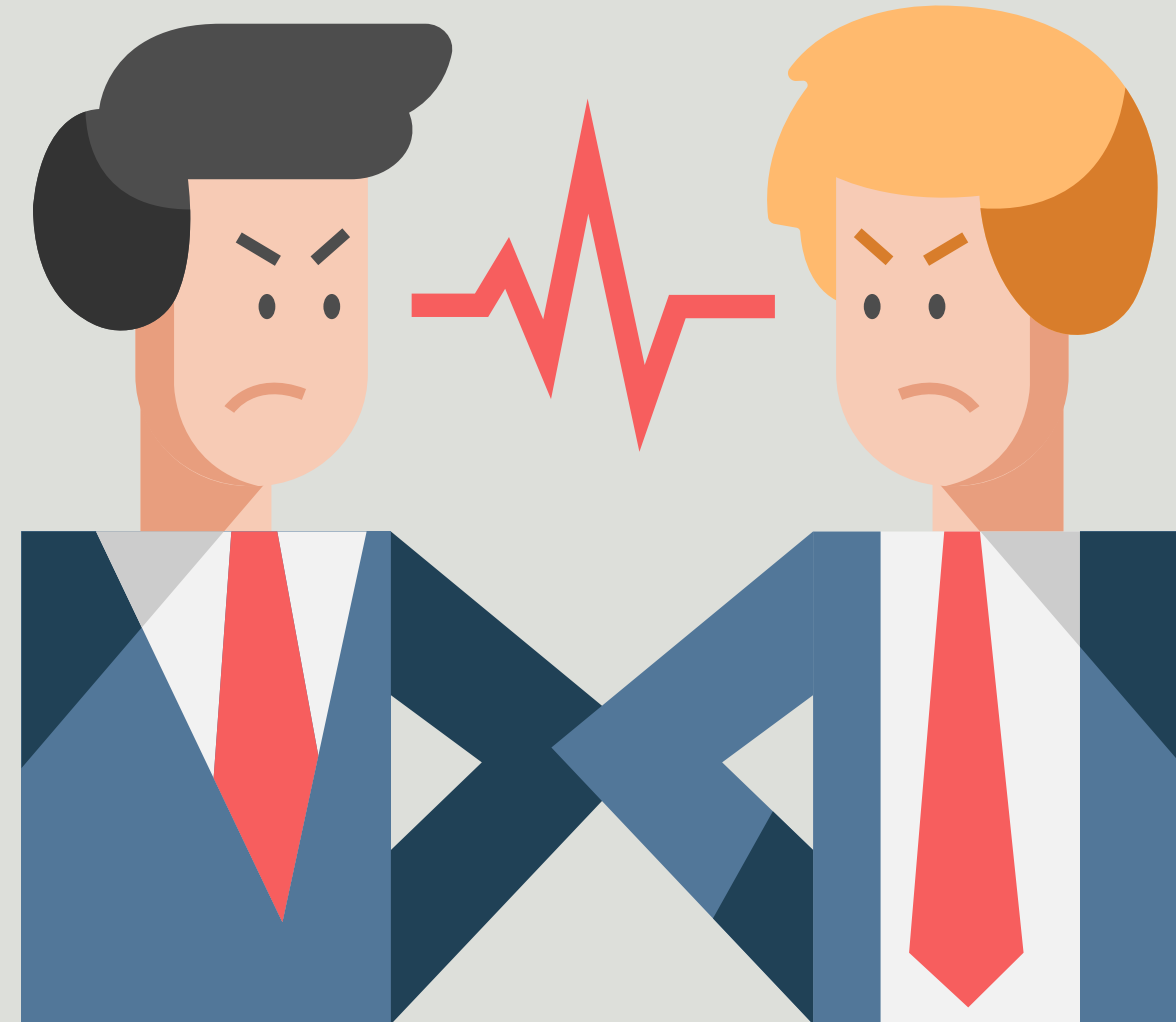- User interaction

PROBLEM STATEMENT

MVP - MINIMUM VIABLE PRODUCT

PRESENT STATE AND COMPETITORS

- Face competition from recommendation systems
- Minimize the impact of diversity
- Incomplete resolution of the Cold Start problem

PROBLEM STATEMENT

MVP - MINIMUM VIABLE PRODUCT
LIMITATIONS

- Low Performance Due to Data Loss
- Difficulty Handling Cold Start
- Slow Response Time
- Limited interpretability
- Depends on input data
- Limited understanding

SOLUTIONS OVERVIEW

- Propose recommendation system
- Collaborative filtering assesses user behavior and preferences by comparing them to similar users, while content-based filtering focuses on the attributes of the products themselves.
- What sets our solution apart is its continuous learning and adaptability. The system automatically adjusts recommendations based on user interactions and feedback, ensuring a constantly evolving and personalized experience.
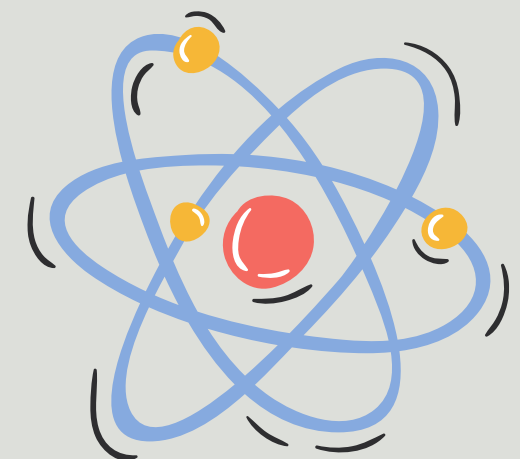
METHODOLOGIES
ARCHITECTURE OR MODEL STRUCTURE

- **Convolutional Neural Networks (CNNs):**
  - **Goal:** Classify and process images of fashion products.
  - **Description**: CNN layers extract features from product images, recognizing patterns, colors, and styles.
- **Recurrent Neural Networks (RNNs):**
  - **Goal:** Process sequential data like user reviews and shopping history.
  - **Description:** RNN layers help the model understand temporal relationships and sequences in data, personalize shopping experiences.
- **Recommender System:**
  - **Goal:** Recommend products based on user shopping history and preferences.
  - **Description:** Use Collaborative Filtering to compare user shopping behavior with others, Content-Based Filtering to suggest similar products based on product features, and Real-time Recommendation to provide immediate suggestions based on user interactions.
- **Backend Server:**
  - **Goal:** Handle business logic, interact with the database, and provide APIs for frontend communication.
  - **Description:** The backend server manages frontend requests, interacts with the database for product and user information retrieval and storage.
- **Database:**
  - **Goal:** Store data related to products, users, shopping history, and reviews.
  - **Description:** Use MySQL, MongoDB to store and manage detailed information about products and users.
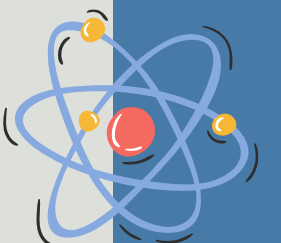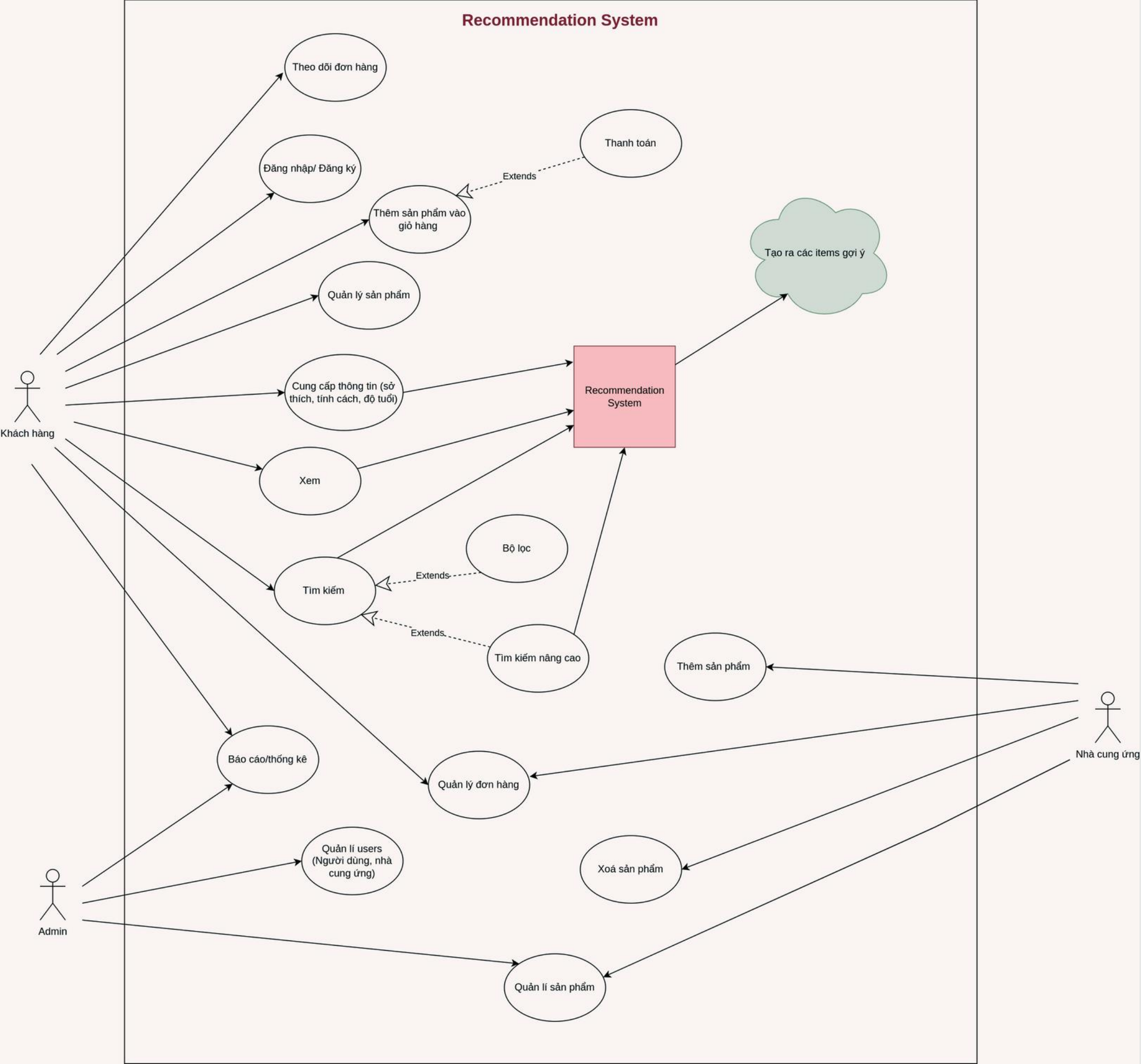
METHODOLOGIES
TECHNOLOGIES PLANNED FOR USE

- **Machine Learning Framework:** Utilize machine learning frameworks such as TensorFlow or PyTorch to build and train AI models.
- **Frontend Framework:** Employ popular frontend frameworks Reactjs to develop an interactive and user-friendly user interface.
- **Database:** Use a suitable database management system like MySQL or MongoDB for data storage and retrieval.
- **APIs and Protocols:** Implement RESTful API for seamless interaction between the frontend and backend.

Recommendation System

- Theo dõi đơn hàng
- Đăng nhập/ Đăng ký
- Thanh toán
- Thêm sản phẩm vào giỏ hàng *(Extends)*
- Quản lý sản phẩm
- Tạo ra các items gợi ý
- Cung cấp thông tin (sở thích, tính cách, độ tuổi)
- Recommendation System
- Xem
- Bộ lọc *(Extends)*
- Tìm kiếm
- Tìm kiếm nâng cao *(Extends)*
- Thêm sản phẩm
- Báo cáo/thống kê
- Quản lý đơn hàng
- Quản lí users (Người dùng, nhà cung ứng)
- Xoá sản phẩm
- Quản lí sản phẩm

Actors: Khách hàng, Admin, Nhà cung ứng

USE CASES

PERFORMANCE METRICS

- **Conversion Rate**
  - Number of transactions / Number of website visits * 100.
- **Retention Rate**
  - (Number of customers at the end of the period - Number of new customers acquired during the period) / Number of customers at the beginning of the period * 100.
- **Shopping Cart Abandonment Rate**
  - (Number of abandoned carts / Number of initiated transactions) * 100.
- **Website Traffic and Unique Visitors**
  - Number of visits, Number of unique visitors.
- **User Engagement**
  - Average session duration, average number of pages per session, click-through rate.
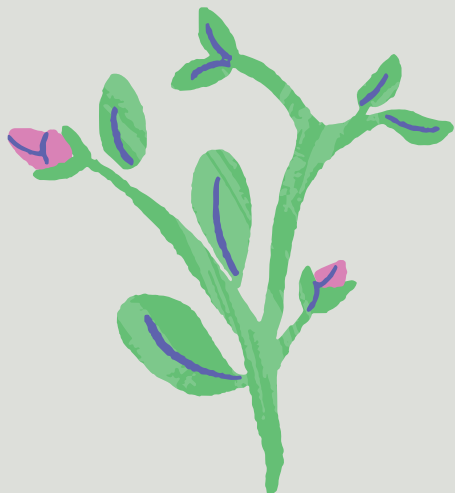
TIMELINE AND ROADMAP

Phase	Mission	Task	Objectives	Timeline
1	Define Strategy and Research	Proposal	Implement ideas in the template	1 week
2	UI Design, Design and Development Planning	UI Design	UI design	5 days
3	Code, Report	Frontend, Backend, AI Model, Visualization	Build model AI combine with web e-commerce	2 weeks

USER INTERFACE

- Link figma: https://www.figma.com/file/VakLhIdrkCtbPeKRAtYADV/Untitled?type=design&node-id=1%3A164&mode=design&t=SzunJLviS9b9GC1V-1

LIMITATIONS AND FUTURE ENHANCEMENTS

Limitations:
- Limited interpretability
- Depends on input data
- Limited understanding

Potential future enhancements:
- Improvements we aim to implement in the future involve incorporating Long-Short Term Memory (LSTM) for predicting market trends. This entails analyzing historical data, market conditions, and seasonal factors to provide predictions for the next 2-3 months. This enhancement will play a crucial role for sales agents to apply informed strategies and make insightful decisions.
- Additionally, we plan to apply eXplainable AI (XAI) to elucidate why the model makes specific predictions over short periods (1 day, 7 days) or longer durations (1 month, 2 months, etc.). This transparency will enhance user trust and understanding, fostering a more reliable and interpretable AI system.

CONCLUSION

MVP Objectives:
- Analyze user preferences based on past purchases, browsing history, and explicit feedback.
- Generate relevant and personalized fashion recommendations to streamline decision-making.
- Improve user engagement and retention by offering an enjoyable and tailored shopping experience.
- Address challenges such as data loss, Cold Start problems, and slow response times.

In summary, the MVP for the recommendation fashion system is designed to be a fundamental yet effective solution, focusing on user-centric improvements to revolutionize the online fashion shopping experience.