VIETNAM DATATHON 2023

Smart Interior **Consultant**

Dataset 4: IKEA Products

Team: HKKTT

SIC

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INTRODUCTION

Overview of the problem

- **Limited Recommendation System:** IKEA's current system may not effectively suggest products based on various factors like colors, shapes, styles, categories, or individual user needs.
- **Lack of personalized recommendations:** Customers are having to spend more time searching for suitable products.
- **Style mismatch:** Customers may face difficulties in finding furniture that compliments their existing home decor or personal style.

The MVP

Our Smart Interior Consultant MVP, exclusively for IKEA, places users in the driver's seat of their interior design journey, allowing them to express their creativity and preferences freely with IKEA's trusted products. It is a platform that respects individuality and empowers users to create living spaces that are both uniquely their own and furnished with IKEA's iconic offerings.

- **Personalized Furniture Arrangement:** Our MVP allows users to provide specific prompts and preferences, such as room dimensions, style preferences, and desired furniture pieces. This user-driven approach ensures that the resulting designs seamlessly integrate IKEA products, reflecting individual tastes and preferences.
- **Efficiency and Convenience:** Our system streamlines the interior design process, enabling users to experiment with multiple IKEA furniture configurations rapidly. This efficiency saves valuable time and ensures that users have the opportunity to explore various design possibilities with IKEA's trusted offerings.
- **User-Friendly Interface:** We prioritize user accessibility. Our intuitive interface ensures that users, regardless of their design expertise, can effortlessly navigate the system, transforming their ideas into captivating interior layouts featuring IKEA's extensive product range.

Purpose

- The System Recommender helps people shop online in a way that's just right for them. Many times, when people look at so many things to buy, it can be confusing.

- This MVP wants to make it easier for users by using smart technology to understand what each person likes. This way, users can enjoy shopping more and find things they really want with less effort.

- The System Recommender aims to make the whole process of finding and buying things online simple and special for each person. It's not just good for users, but also for online shops trying to be the best in the industry. The chance here is to make something that not only helps with what people want at the present but also knows what they might like in the future as things change in online shopping.

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PROBLEM STATEMENT

The problem that the MVP seeks to solve.

- Users spend significant time searching for individual IKEA furniture items.
- Users struggle to find suitable options within IKEA's collections and pre-designed combos.
- The interior design process lacks personalization and guidance.
- Users often face suboptimal outcomes in their room layouts.
- There is a need for a user-friendly and AI-powered solution.

The pain points, inefficiencies associated with the problem.

- Time-Consuming Search Process: The current online shopping landscape can be time-consuming as users manually search through numerous products to find items matching their preferences. This inefficiency hinders the overall shopping experience.
- Decision Fatigue: Users face a significant challenge in sifting through a large number of products, leading to decision fatigue. This results in stress and confusion, making it harder for users to make informed and satisfying choices.

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SOLUTION OVERVIEW

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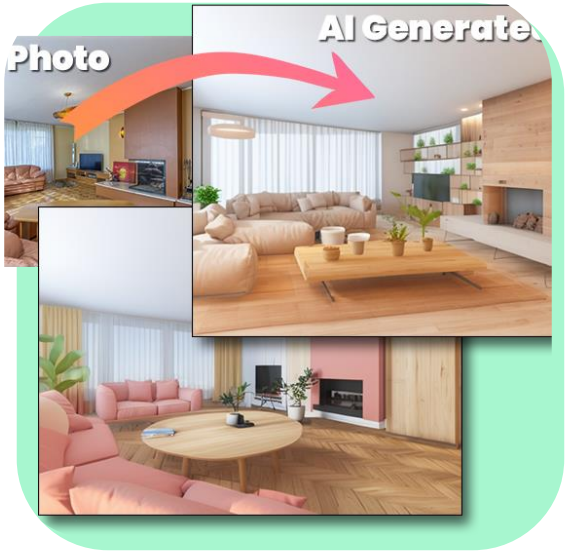
To enhance customers' shopping experience, we provide an AI tool that generates highly recommended interior sets based on their prompts such as style, budget, color, size, etc.



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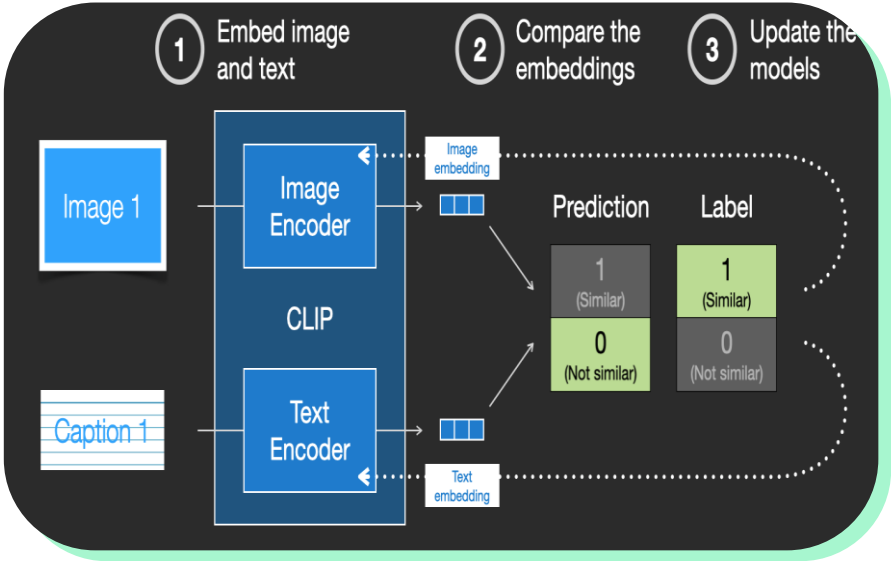
METHODOLOGIES

METHODOLOGIES

Using a **stable-diffusion model** to generate some sample interior concepts based on users' input prompt

Key components: Image Modification, Upscaling and Inpainting



METHODOLOGIES

KEY COMPONENTS

Image Modification

- Depth-conditional
- Img2Img

Image Upscaling

- Depth-conditional
- Img2Img

Image Inpainting

- Depth-conditional
- Img2Img

METHODOLOGIES

ARCHITECTURE

Model uses

- 865M UNet for downloadsampling factor 8 autoencoder
- OpenCLIP ViT-H/14 for text encoder
- SD v-2 for producing outputs

Evaluation:

With different classifier-free guidance scales (1.5, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0) and 50 DDIM sampling steps

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CORE FUNCTIONALITY

CORE FUNCTIONALITY

1. **Generate Recommended Items:** a curated list of IKEA furniture and decor items that align with their specified prompts and preferences.
2. **Generate Room Visualizations with IKEA Furniture:** visualizations of room layouts using IKEA furniture recommendations.
3. **Show Detailed Item Information:** for each recommended item, display essential information, including:
    - Name
    - Description
    - Price
    - Availability
    - Link to official website
4. **Side-by-Side Items Comparison:** enable users to compare recommended items with each other.

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PERFORMANCE METRICS

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User Experience Metrics:

- Accuracy of Style Matching: user surveys or feedback forms to measure how well the generated layouts match the user's inputted style preferences.
- Ease of Use: Evaluate the user interface for intuitiveness and ease of navigation.
- Engagement Metrics: Track user engagement metrics like number of prompts entered, frequency of use, session duration, and return rate.
- User Feedback Collection: Collect and analyze user feedback, including suggestions for improvements and reported issues.

PERFORMANCE METRICS

Technical Performance Metrics:

- Generation Time: Measure the time taken from inputting a prompt to displaying the final layout.
- Quality of Visual Output: Assess the resolution, detail, and aesthetic appeal of the generated images. This could be done through user ratings.
- Content Filtering: Discuss mechanisms in place to prevent the generation of harmful or inappropriate content.
- Bias and Fairness: Address any known biases in the model and steps taken to mitigate them.
- Use Case Restrictions: Note any restrictions on use cases for ethical reasons.

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TIMELINE & ROADMAP

TIMELINE & ROADMAP

TASK	TIME	MEMBER	November
Prepare knowledge about: How to build model AI	Nov 01 - 06	All members	
Complete the exam registration application	Nov 04	All members	
Research 5 datasets about the domain of retail provided by the organizers	Nov 06 – 10	All members	
Select a dataset to develop and learn thoroughly about issues and objects related to the dataset	Nov 10 – 11	All members	
Search for Data/AI solutions for related datasets and models	Nov 11 - 13	Khôi, Kiệt	
Complete proposal Idea (1. Introduction, 2. Problem Statement)	Nov 13 - 15	Trí	
Complete proposal Idea (3. Solution Overview, 4. Methodologies, 5. Core Functionality)	Nov 12 - 16	Khôi, Kiệt	
Complete proposal Idea (6. Performance, 9. Limitation and Future Enhancements)	Nov 13 - 15	Thảo	
Complete proposal Idea (7. Timeline and Roadmap, 8. User Interface (UI) or Interaction)	Nov 13 - 15	Hiếu	
Complete proposal Idea (10. Conclusion)	Nov 16 - 17	All members	
Check a PowerPoint to share the team's ideas on how to build an MVP	Nov 17 - 19	All members	
Write your CV according to the template provided by the organizers.	Nov 18 - 19	All members	
Submit Proposal Idea report, member's CV and PowerPoint presentation of ideas	Nov 19	Thảo	
Team training	Nov 20 – 30	All members	
Review the group's ideas and suggestions for improvement	Nov 28 -Dec 01	All members	

TIMELINE & ROADMAP

TASK	TIME	MEMBER	December
Participate in Workshop and Training of the program	Dec 02 - 03	All members	
Participate in working with Mentor to prepare for Datathon Day about technology, advice on problems that need to be solved,...	Dec 04 - 15	All members	
Prepare before the final day of Datathon: about ideas, scope and problems that need to be solved and prepare some necessary models for the competition.	Dec 08 - 15	All members	
Code & prepare presentation	10:00 Dec 16 - 10: 00 Dec 17	All members	
Participate in elimination round	10:00 - 12:00 Dec 17	All members	
Participate in the final round: Present to judges	14:00 - 16:00 Dec 17	All members	
Participate in award ceremony	17:00 - 19:00 Dec 17	All members	

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USER INTERFACE

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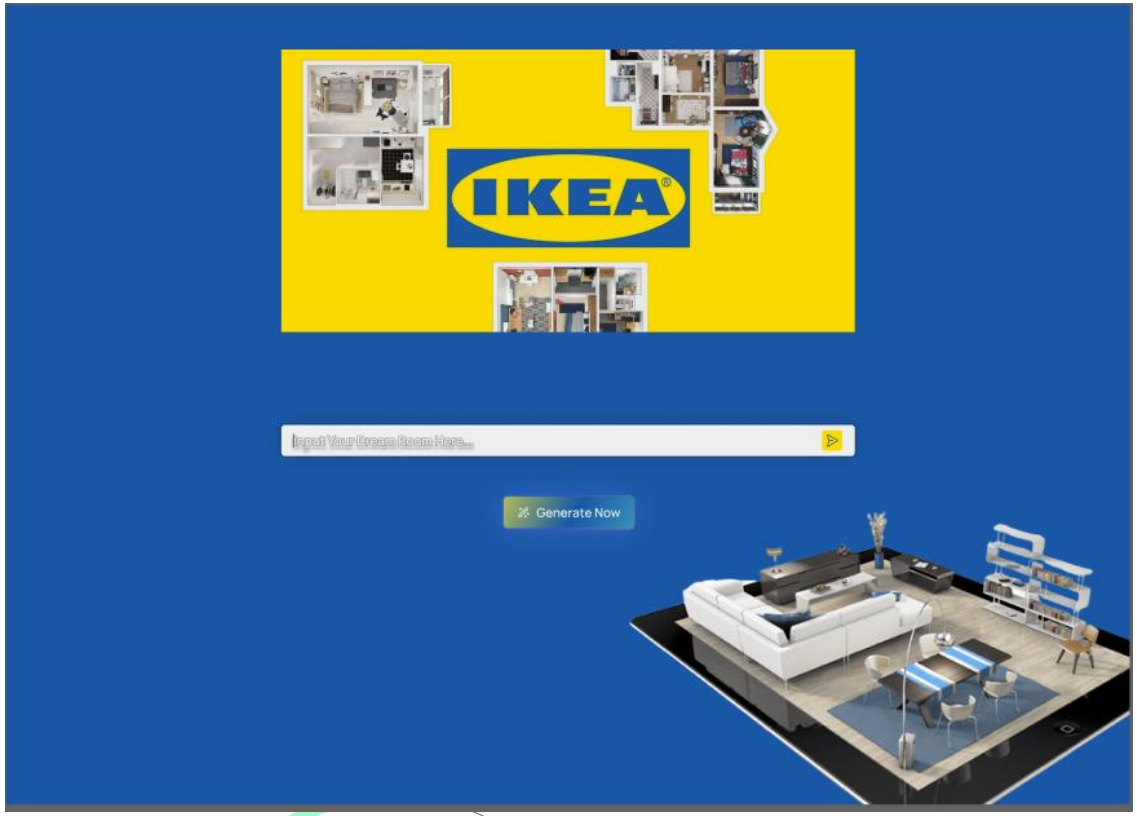

USER INTERFACE

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CONCLUSION

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Desire to create a simple, easy-to-use model so that ordinary customers who do not have much knowledge about technology can still use and access IKEA products to increase the user experience of the products and increase sales.