Interiors IQ

A tool that can visualizes the suitabilities of interiors and gives out designing ideas

Presented by: **TEAM 143**
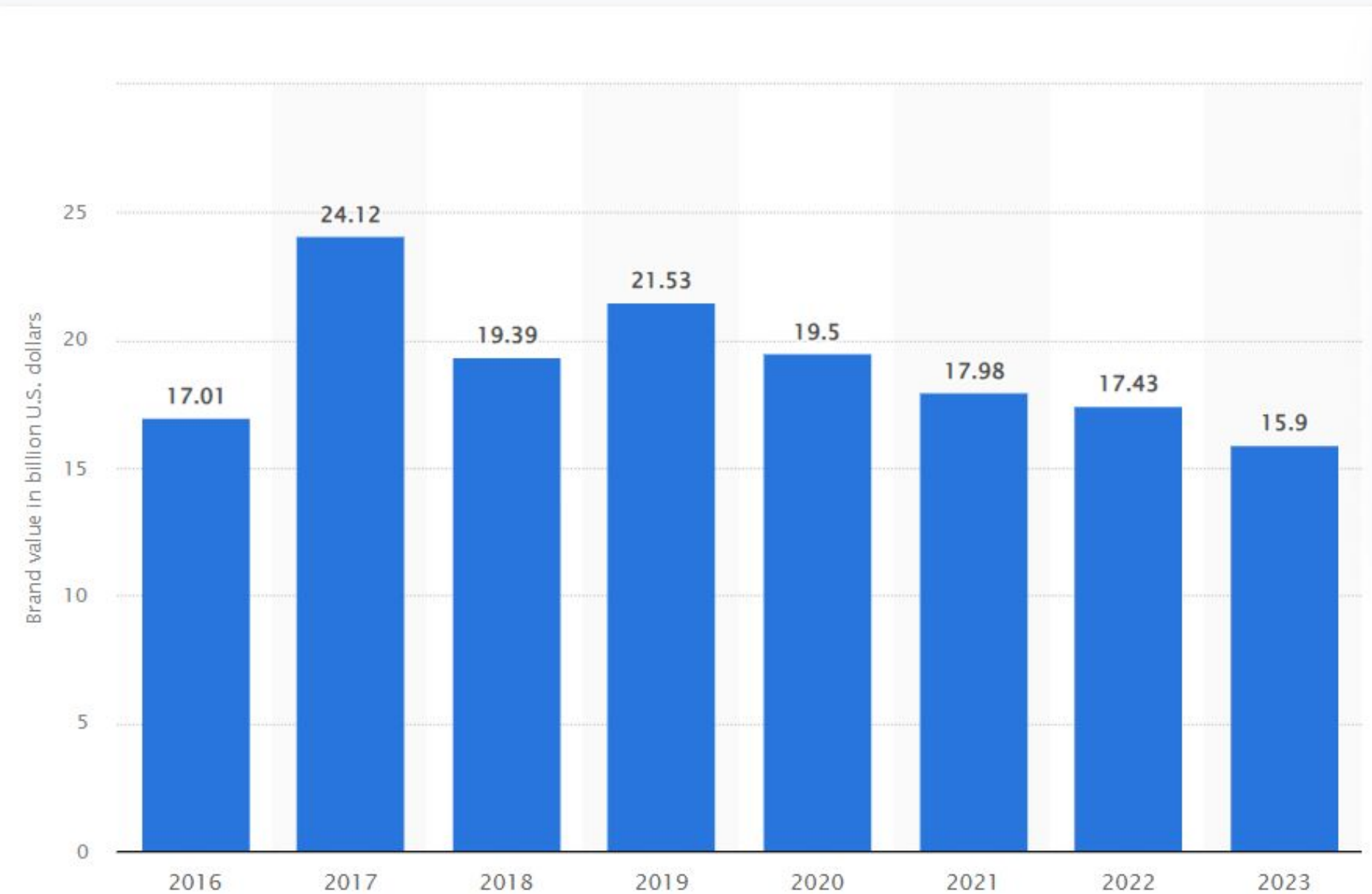
SBS Group 2

Overview about IKEA

- In 2023, IKEA's brand value amounted to 15.9 billion U.S. dollars, down from 17.43 billion dollars in 2022. However, despite the decline, IKEA was the [most valuable brand in the Nordic region](#) that year, surpassing other major companies such as Equinor and H&M.

- Founded in 1943 in Älmhult, Sweden, IKEA is an internationally known home furnishing retailer. The brand is recognized for its Scandinavian style. Offering low prices and a large range of products, the company enjoys a high level of awareness among consumers. According to a survey conducted by Statista in 2022, 90 percent of [furniture online shop users in the United States knew the brand](#). In the UK, IKEA's brand awareness reached 94 percent.

IKEA's brand value worldwide from 2016 to 2023
(in billion U.S. dollars)

Year	Brand value
2016	17.01
2017	24.12
2018	19.39
2019	21.53
2020	19.5
2021	17.98
2022	17.43
2023	15.9

Source: Statista. (2023, November 7). *IKEA: brand value worldwide 2016-2023.*
https://www.statista.com/statistics/980112/brand-value-of-ikea-worldwide/

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1. PROBLEMS

Regular problems when purchasing from IKEA

Product Selection Difficulty: challenging to decide which IKEA products to purchase when decorating their homes. This difficulty can stem from uncertainty about which products will complement each other or feeling overwhelmed by the vast array of IKEA products available.

Design Inexperience: New homeowners frequently struggle to select suitable interiors for their homes. This struggle can arise from a lack of experience in interior design or difficulty aligning their personal style with available products.

=> Interiors IQ can not only help customers overcome this uncertainty by providing a visual representation of how potential furniture pieces would look in their existing space but also can assist new homeowners in selecting furnishings that suit their style and functional needs

2. INTRODUCTION OF IDEAS

The MVP for this project is an innovative interior design generation tool. This tool is designed to **help users generate creative and personalized design ideas for their homes**. Users can input prompts or keywords, then the tool will use these inputs to generate design ideas.

By leveraging **Dataset 4**: IKEA Products, the tool can generate **realistic and aesthetically pleasing designs** that align with the user's budget constraints. This ensures that the designs are not only visually appealing but also financially feasible for the user.

In essence, the MVP serves as a bridge between the user's design aspirations and their budget, providing a platform for users to **explore and realize their interior design ideas**. It's **a step towards making interior design more accessible and enjoyable for everyone.**

3. PROPOSAL
Methodologies

Natural Language Processing (NLP)

- Prompt Understanding: NLP techniques can be used to analyze the customer's prompt and extract key information such as the desired style, color scheme, budget, and functional requirements: **Codiga, Pylint, and Prospector**
- Product Recommendation: NLP models can be trained on the IKEA product dataset to identify products that match the customer's preferences and the overall design style.
- Style Transfer: NLP models can be used to transfer style elements from existing design inspiration images to generate new design suggestions.

Machine Learning (ML)

- Generative Models: Generative models, such as variational autoencoders (VAEs) and generative adversarial networks (GANs), can be used to generate new interior design layouts and arrangements based on the customer's preferences: **Tailornova**
- Style Adaptation: ML algorithms can be trained to adapt existing interior design styles to match the customer's specific preferences, even if they are not explicitly stated in the prompt.
- Recommendation Systems: ML-based recommendation systems can suggest additional products to complement the customer's initial selection, ensuring a cohesive and well-rounded design.

Computer vision (CV)

- 3D Scene Reconstruction: CV techniques can be used to reconstruct a 3D model of the customer's room or space based on their description or provided images.
- Image Generation: CV models can generate realistic images of the interior design, allowing the customer to visualize the proposed design before implementation.
- Style Transfer: CV algorithms can be used to transfer style elements from existing design inspiration images to the generated interior design images, ensuring a consistent aesthetic.

4. OVERALL SOLUTION

Understand customer preferences

Design generation based on prompts: Users will have the ability to provide prompts that depict their preferred style and budget for interior design. Subsequently, the tool will employ this information to generate a plethora of design optionS

Provide a personalized mood board

Employ AI-powered tools to generate mood boards that align with the customer's preferences, incorporating furniture, décor, and color palettes

Offer 3D visualization

Create realistic 3D renderings of the customer's home, allowing them to visualize the interior design choices in their actual space

Curated product recommendations

Recommend furniture, décor, and accessories that match the customer's style and budget, using a vast product database and AI-powered matching algorithms

4. OVERALL SOLUTION

Provide expert guidance

Offer consultations with interior designers who can provide personalized advice, address specific concerns, and assist in the finalization of design decisions

Streamlined purchasing process

Facilitate a seamless purchasing experience by integrating e-commerce capabilities, enabling customers to directly purchase recommended products
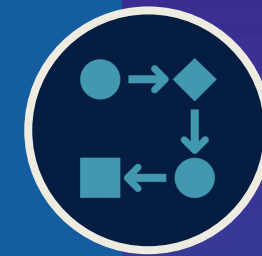
Post-purchase support

Offer ongoing support to ensure customer satisfaction, addressing any questions or concerns that may arise after the purchase

HOW IT WORKS

The interior design generation tool works by using a combination of artificial intelligence and user input to generate design ideas

User Input

The user provides prompts or keywords that describe their design preferences. This could include things like color schemes, styles (modern, traditional, etc.), specific furniture items, specific information about the rooms that the customer wants to decorate and more

Data Processing

The tool processes these inputs and translates them into parameters that can be understood by the AI model. For example, if a user mentions "modern design", the tool might translate this into specific characteristics associated with modern design, such as clean lines, minimalistic furniture, etc.

Design Generation

The AI model then uses these parameters to generate design ideas. It does this by searching through the IKEA Products dataset for items that match the user's preferences and budget. The AI model also considers aesthetic principles to ensure the generated designs are visually pleasing.
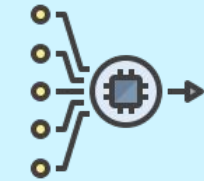
Output

The tool presents the generated design ideas to the user. The user can then provide feedback, which the tool can use to refine future design suggestions.

HOW IT WORKS

Let's take the example of a user who wants to design a **bedroom** in a **cute style**. Here's how they would use the tool:

User Input

The user input keywords:
+ Style: cute
+ Type of room: bedroom
+ Color schemes: pink
+ Budget: 300-450 USD
+ Materials: Wood, Metal, Fabric
+ Texture: Smooth, Rough, Soft

Data Processing

The tool would then process and translate all the keywords into specific design elements associated with a cute style. This include bedroom furniture, pink varieties, suitable materials and decor that are in the designated price range.
This step takes approximately 1 minute to be done by AI.

Design Generation

Based on the data, it would search through the IKEA Products dataset for items that match the user's preferences. It would also consider the principles of interior design to ensure the generated designs are aesthetically pleasing.
This step should take less than 2 minutes to finish.
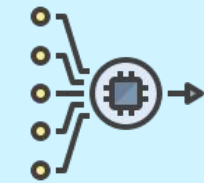
Output

The tool would then present the generated design ideas to the user. These include:
+ a list of recommended IKEA products
+ a proposed layout for the room
+ visual representations of the design.

Why the solution is special?

3D visualization

This is exactly a virtual designing room

- **Enhanced realism and depth perception**

- **Interactive exploration and flexibility**

- **Increase Creativity**

- **Easily customize rooms by own ideas**

CORE FUNCTIONALITY For Customers

01 Design generation based on prompts: Users will have the ability to provide prompts that depict their preferred style and budget for interior design. Subsequently, the tool will employ this information to generate a plethora of design options

02 Examine and propose particular items, subsequently generate a preliminary version for the client.

03 Recommendations for IKEA products: The tool will propose suitable IKEA products that align with the user's desired style and budget.

04 Visualization in 3D: Users will have the capability to observe 3D visualizations of the designs they have generated.

05 Creation of a shopping list: The tool will create a comprehensive shopping list consisting of IKEA products that the user can purchase to materialize their desired design.

CORE FUNCTIONALITY For IKEA

01 Inquire about the room's dimensions and the customer's style preferences in order to create a basic layout.

02 Obtain information about the customer's furniture budget and their desired style and color choices, and then suggest appropriate furniture options.

03 Utilize advanced 3D modeling software to generate realistic visual representations of the interior design, allowing the customer to view and modify the design in real time.

04 Collaborate with online furniture retailers to simplify the furniture purchasing process for customers, providing direct links to product pages and enabling seamless checkout from within the interior design tool.

05 Utilize data collected from customer interactions with the interior design tool to analyze their preferences using machine learning algorithms, and offer personalized recommendations for furniture, decor, and accessories accordingly.

PERFORMANCE METRICS

1. **Accuracy:** Measures the ability to generate designs that match the customer's prompt. For instance, if a customer requests a warming living room, the tool should produce a design with clean lines, natural materials, and light colors.
2. **Creativity:** Measures the ability to generate original, innovative, and visually appealing designs.
3. **User Satisfaction:** Measures the level of satisfaction that customers have with the generated designs.
4. **Completion Rate:** Measures the percentage of prompts that the tool is able to generate designs for.
5. **Time to Completion:** Measures the average amount of time it takes for the tool to generate a design for a prompt.
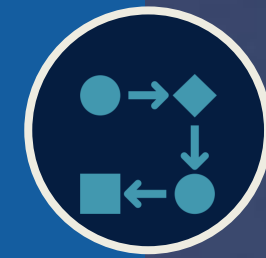
Year 1

Year 2

Year 3

Phase 1: Data Exploration and Analysis (3 months)

- Objective: Familiarize the team with the IKEA Products dataset and gain insights into the characteristics and relationships between different IKEA products.
- Activities: Clean and prepare the dataset for analysis; perform exploratory data analysis to identify patterns, trends, and correlations within the data; conduct market research to understand user needs and preferences in interior design

Phase 2: Machine Learning Model Development (6 months)

- Objective: Develop a machine learning model that can learn to associate different IKEA products with different interior design styles and visualize the suitabilities of interiors.
- Activities: Select suitable machine learning algorithms for the task; train and evaluate the machine learning model using the IKEA Products dataset; refine the model based on evaluation results and incorporate feedback from stakeholders

Phase 3: Recommendation Engine Development (3 months)

- Objective: Develop a recommendation engine that can suggest IKEA products to users based on their past purchases and preferences.
- Activities: Design and implement a recommendation engine using collaborative filtering or content-based filtering techniques; integrate the recommendation engine with the interior design generation tool; evaluate the effectiveness of the recommendation engine using user feedback and A/B testing

Phase 4: Price Comparison Tool Development (3 months)

- Objective: Develop a price comparison tool that can help users find the best deals on IKEA products.
- Activities: Utilize web scraping techniques to gather price data from various online retailers; implement a price comparison algorithm to identify the most affordable options for IKEA products; integrate the price comparison tool into the interior design generation tool

Phase 5: User Interface and User Experience (UI/UX) Design (9-months)

- Objective: Design a user-friendly and intuitive interface for the interior design generation tool.
- Activities: Conduct user research to understand user needs and preferences in interior design tools; develop wireframes and prototypes of the tool's interface; ather feedback from users through usability testing and iterate on the design

Phase 6: Solution Deployment and Testing (6 months)

- Objective: Deploy the interior design generation tool to a production environment and conduct extensive testing.
- Activities: Deploy the tool to a cloud-based platform for scalability and accessibility; conduct thorough testing to ensure the tool's functionality, performance, and security; gather user feedback and address any issues that arise during testing

Phase 7: Market Launch and Expansion (6 months)

- Objective: Launch the interior design generation tool in the market and expand its reach to other furniture retailers.
- Activities:Develop a comprehensive marketing strategy to promote the tool to target audiences; establish partnerships with other furniture retailers to integrate the tool into their platforms; gather feedback from users and continuously improve the tool's features and functionality

5. TIMELINE (TENTATIVE)

Conclusion

The proposed MVP, Interiors IQ, addresses the common challenges faced by IKEA customers in selecting and envisioning suitable interior designs for their homes. By leveraging AI-powered tools, Interiors IQ provides a comprehensive solution that streamlines the interior design process, enhances customer satisfaction, and promotes sales for IKEA.

Interiors IQ's core functionalities include:

- **Personalized design generation based on prompts:** Users can input their desired style, budget, and functional requirements, and Interiors IQ will generate a variety of design options.
- **Curated product recommendations:** Interiors IQ recommends suitable IKEA products that align with the user's preferences and the overall design style.
- **3D visualization:** Users can visualize their proposed designs in a realistic 3D environment, allowing them to make informed decisions before implementation.

The potential impact and benefits of Interiors IQ are significant:

- **Enhanced customer experience:** Interiors IQ empowers customers to make informed and confident interior design decisions, leading to increased satisfaction and loyalty.
- **Improved sales for IKEA:** By providing customers with a personalized and visually appealing design experience, Interiors IQ can drive sales and increase revenue for IKEA.
- **Brand differentiation and innovation:** Interiors IQ positions IKEA as a leader in innovative customer-centric solutions, further strengthening its brand reputation

6. OUR TEAM - 143

Pham Thi Hoang Anh

Project Manager

- Activities: Creates project plans, assigns tasks, tracks progress, and manages communication between team members.
- Strengths: Strong organizational skills, effective communication skills, and the ability to manage multiple projects simultaneously.

Hoang Thi Anh Quan

Backend Developer

- Activities: Designs and implements the backend architecture, writes code to handle data ingestion, processing, and storage, and integrates with external APIs.
- Strengths: Strong programming skills, experience with backend development frameworks, and the ability to build robust and scalable systems

To Truong Dong

Data Scientist

- Activities: Gathers data from various sources, such as IKEA product catalogs, interior design blogs, and social media, and uses machine learning techniques to analyze the data.
- Strengths: Strong analytical skills, programming expertise, and a deep understanding of machine learning algorithms.

Chau Tran Thien Kiem

UX/UI Designer

- Activities: Creates wireframes, mockups, and prototypes of the tool, and conducts user testing to gather feedback and make improvements.
- Strengths: Strong design skills, a deep understanding of user-centered design principles, and the ability to create visually appealing and user-friendly interfaces.

Do Xuan My Linh

Content Strategist

- Activities: Writes blog posts, creates social media content, and produces other types of marketing materials to promote the tool.
- Strengths: Strong writing and editing skills, a deep understanding of content marketing principles, and the ability to create engaging and informative content.

VIETNAM DATATHON 2023

Thank you!

Connect with us.

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