

[48-724]

Scripting and Parametric Design

A Generative Method
to ReFrame Visitor Experience

in **IKEA**

Project Team

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Project Initiative

Maze of IKEA Initiative



IKEA is known for its unique shopping experience with its store layout, which is designed to guide customers through the store in a specific way. The purpose of this layout is to make it easy for customers to find the items they are looking for and to encourage them to explore the entire store.

Maze of IKEA Initiative



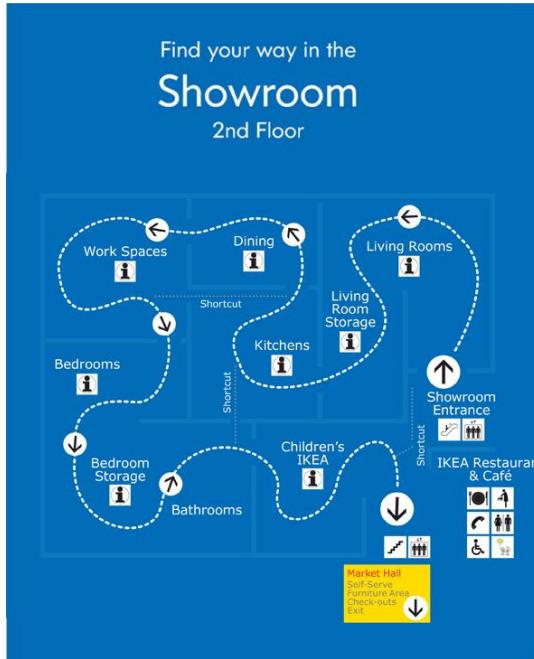
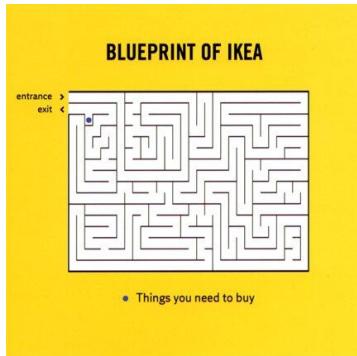
Products in IKEA are constantly being updated, driven by customer preferences and market activities. However, the interior layout of the showroom constantly remain the same - leaving **more to be desired by visitors of IKEA**.

Maze of IKEA Initiative



The project seeks to provide **a generative method to facilitate periodical update of the interior layout** in IKEA - proactively refreshing the storefront interior layout and keeping customers engaged by the **shopping experience**, whereas also provide readily available data for sales analysis based on post-occupancy studies of variants of interior layouts.

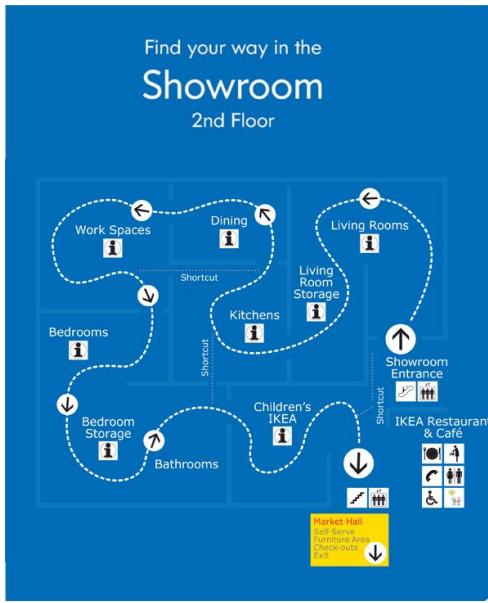
IKEA Showroom Initiative



The products in **IKEA** are constantly being updated, driven by customer preferences and market activity. However, the interior layout of the showroom remains consistently the same - leaving **a bit more to be desired by frequent visitor of IKEA.**

Design Elements in IKEA

Design Element Circulation Path



The basic principle behind IKEA's store layout is to **create a circulation path** that guides customers through the store in a logical and intuitive way. This typically involves starting at the entrance and **following a predetermined route** through the store, which is marked by signage and other visual cues. As customers make their way through the store, they are encouraged to explore different areas - composed with **showrooms** and **marketplaces** of different categories.

Design Element Circulation Path (metrics)



Turning Radius
(ft)

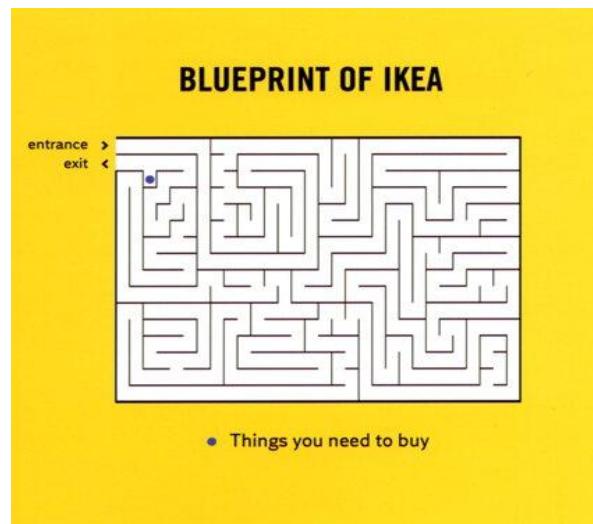


Path Width
(ft)



Overall Length
(ft)

Design Element Circulation Path



Design Element Show Rooms



One key feature of IKEA's store layout is the use of **inspiration rooms**, which are miniature versions of real-life living spaces that are designed to showcase IKEA's furniture and home accessories in a design-oriented setting. These rooms are **arranged along the circulation path** in conjunction to marketplace, and are meant to **inspire customers with ideas** for how they can use IKEA products in their own homes.

Design Element Market Place



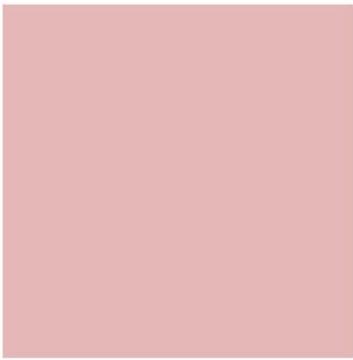
The IKEA marketplace is unique because it is designed to provide customers with **a vast array of options and choices**. The marketplace features a wide range of products from different categories, including furniture, utensils, light fixtures, and more. This allows customers to easily compare different products and choose the ones that best meet their needs and preferences.'

Marketplace display areas are **divided into areas of various sizes** to incorporate demands for showcasing furnitures of varying scales.

Algorithm Overview

Algorithm Overview

Selection

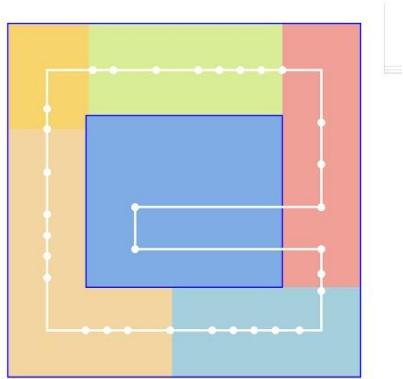
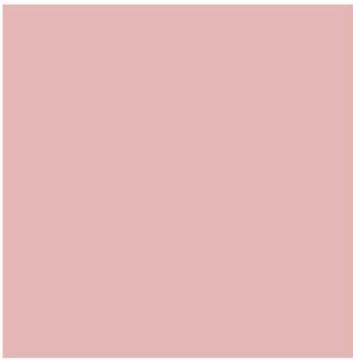


Step 0 - Site Boundary

1. 200x200 floor area (the conventional IKEA showroom dimension)

Algorithm Overview

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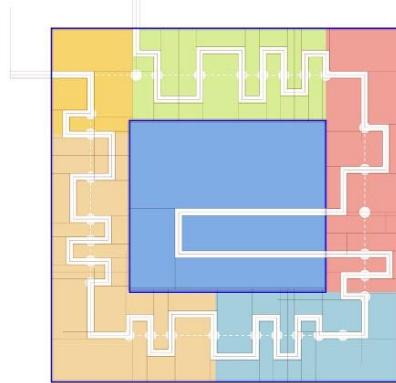
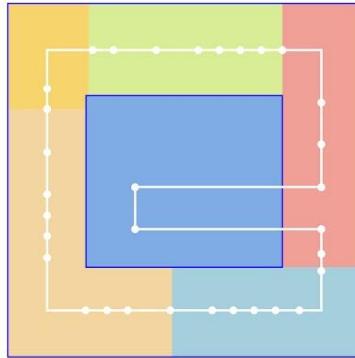
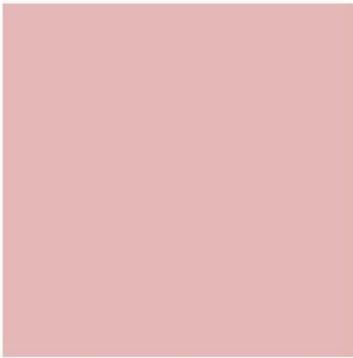
1. 200x200 floor area (the conventional IKEA showroom dimension)

Part 1 - Average Circulation

1. Random **division of spaces** based on product categories
2. Random points (points list) on path to **define circulation sequence** for next-step.

Algorithm Overview

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Part 2 - Path + Space Divider

1. Based on designated circulation path, add **random variation recursion** event to generate circulation path inside individual areas.
2. Project **intersection points** to all sides of the site boundary..

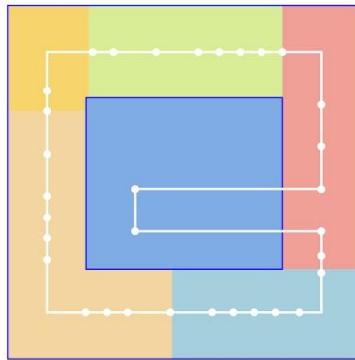
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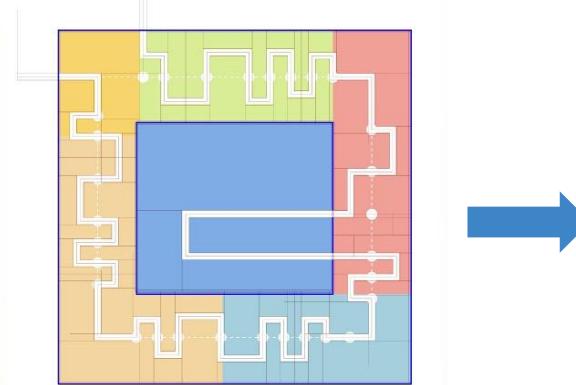
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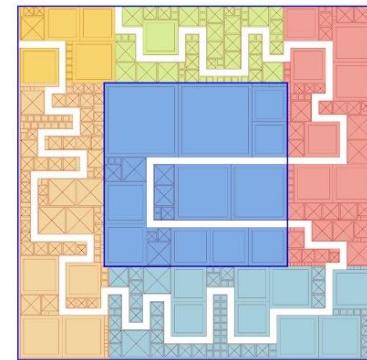


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Final result



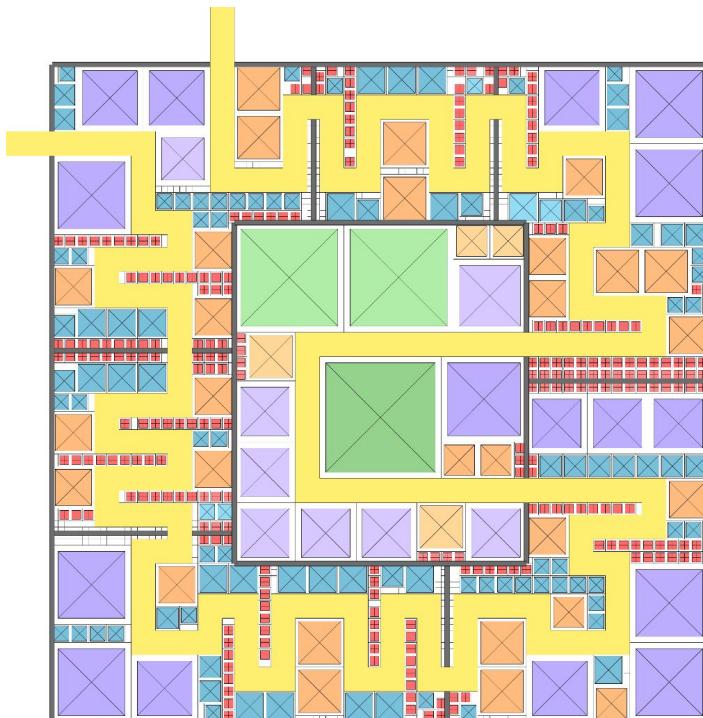
Part 2 - Path + Space Divider

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Part 3 - Define Display Area

1. Operate recursion event to articulate **potential product layout** in individual spaces; intended consistency of dividing spaces in squares for modularity purpose (**Data-based allocation** of Area display/ Item display/ Shelving units / Partition wall).

Algorithm Export Sample



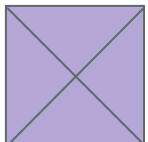
XS Extra Small Area



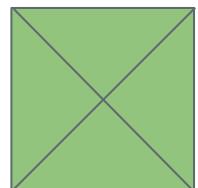
S Small Area



M Medium Area



L Large Area



XL Extra Large Area

Algorithm Parameters and Output

Overall Floor Area



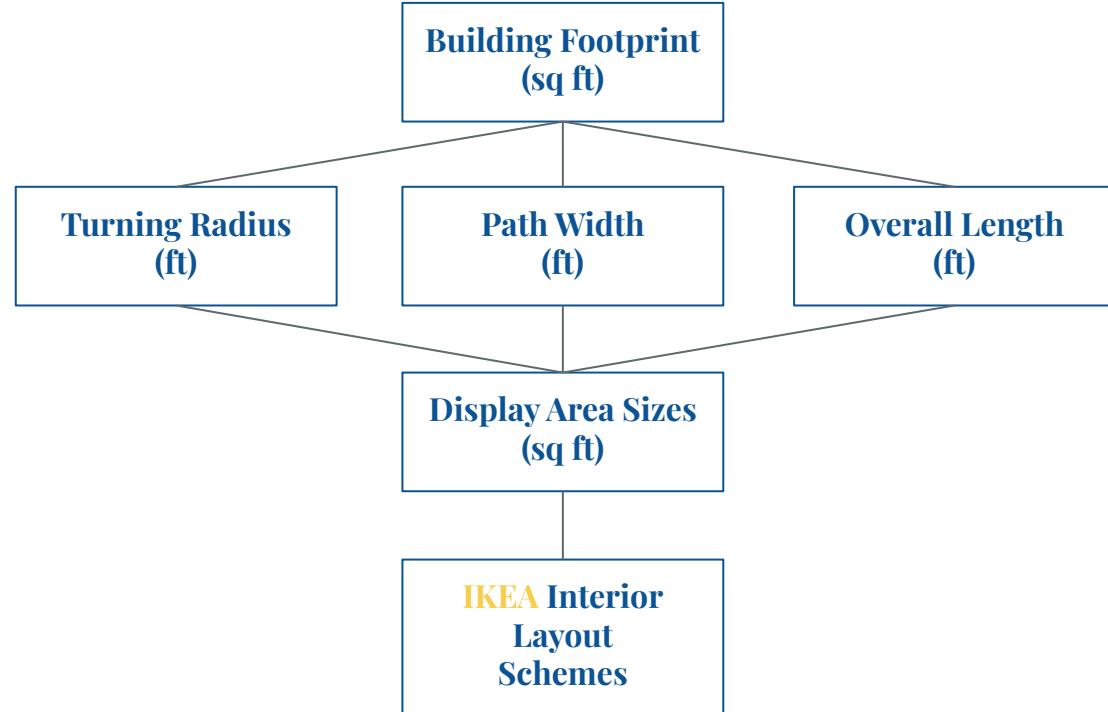
Circulation Path



Furniture Display



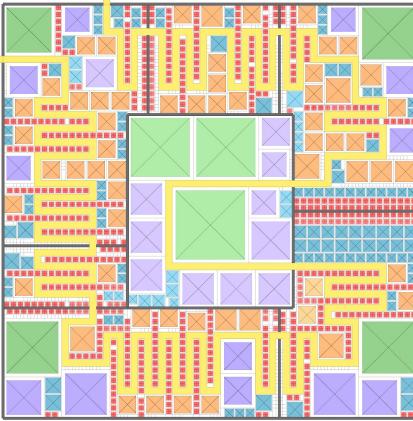
Design Output



Plugin Demo

Design Scenarios

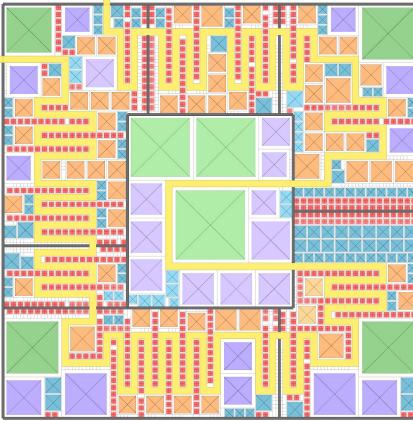
Design Scenario Variations



Parameter 1 - Turning Radius

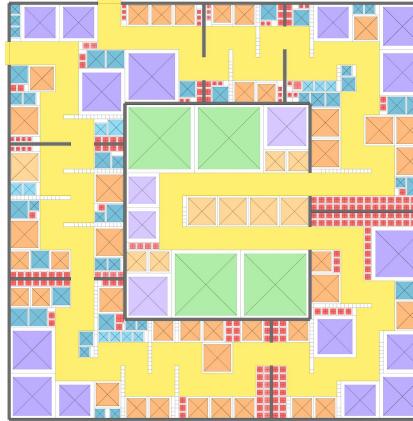
Gives designers the ability to increase or decrease the turning radius of the path, therefore creating a series of results with various rhythm and path lengths traveled

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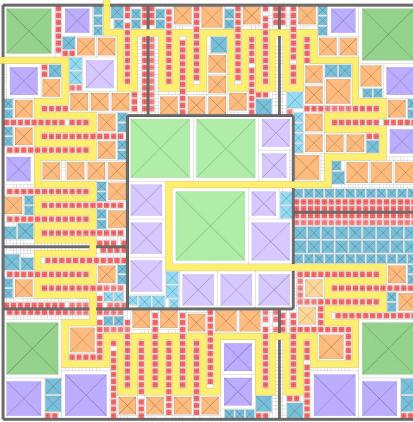
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Parameter 2 - Path Width

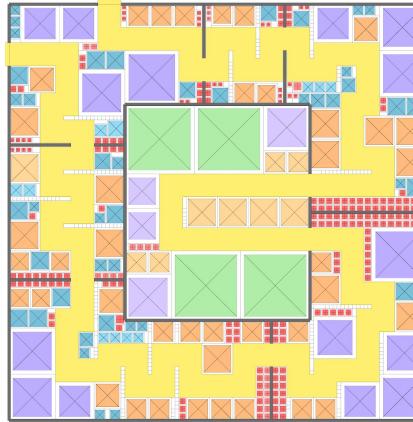
Provides designers the choice of how wide to make the main circulation corridor to fit a variety of spatial needs.

Design Scenario Variations



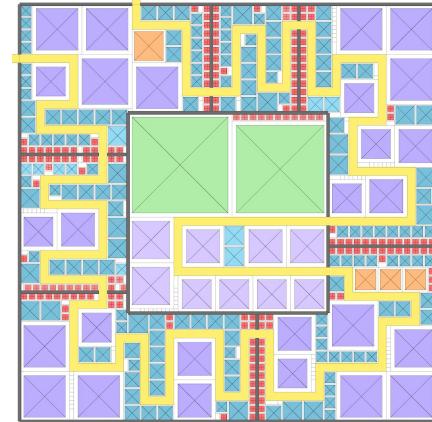
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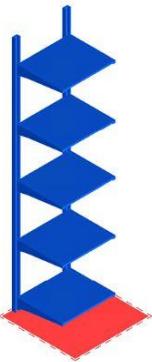


Parameter 3 - Offset Distance

Algorithm is parameterized to define offset distance from the central circulation path - articulating overall travel distance and display area properties

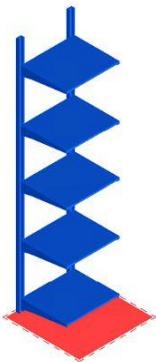
Display Typologies

IKEA Display Typologies

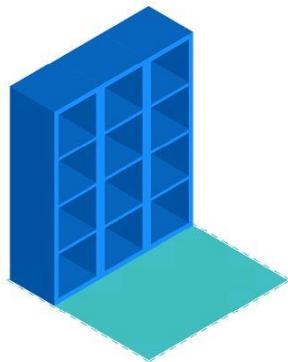


2x2 - Flat Wall Shelving

IKEA Display Typologies

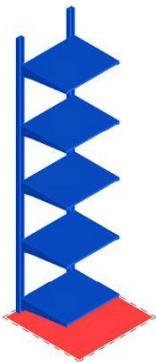


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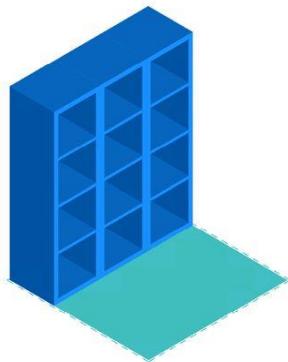


4x4 - Box Shelving

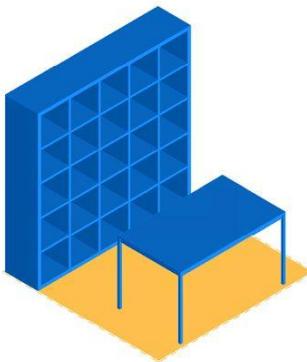
IKEA Display Typologies



2x2 - Flat Wall Shelving

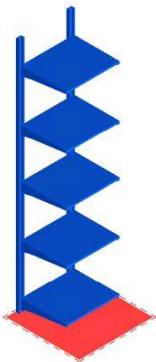


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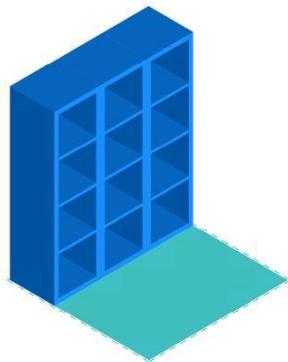


6x6 - Box Shelving & Table

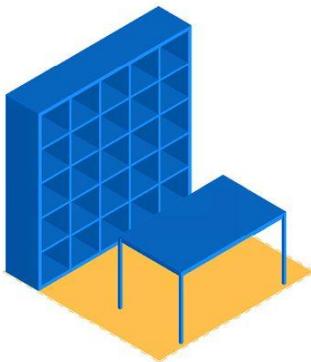
IKEA Display Typologies



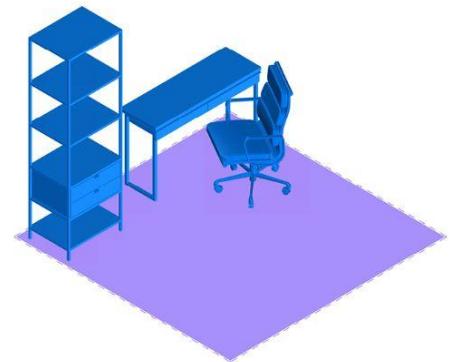
2x2 - Flat Wall Shelving



4x4 - Box Shelving

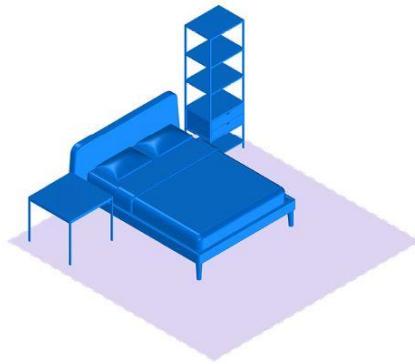


6x6 - Box Shelving & Table



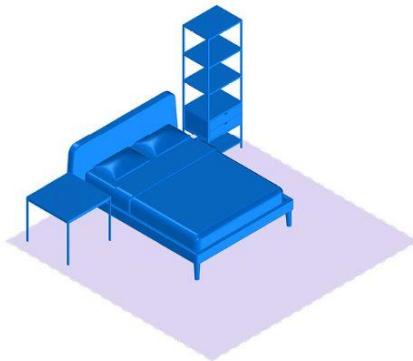
8x8 - Small Scene

IKEA Display Typologies

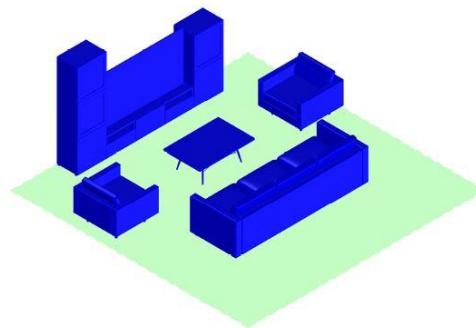


12x12 - Medium Scene

IKEA Display Typologies

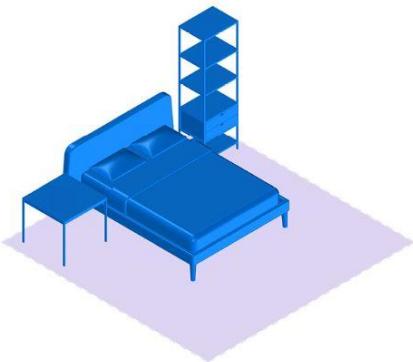


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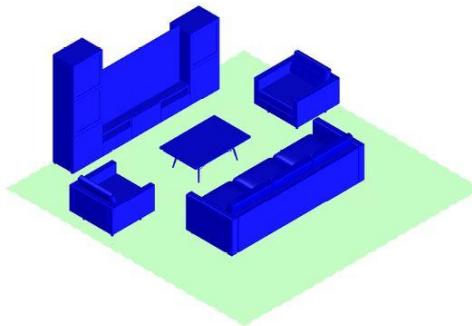


16x16 - Large Room Scene

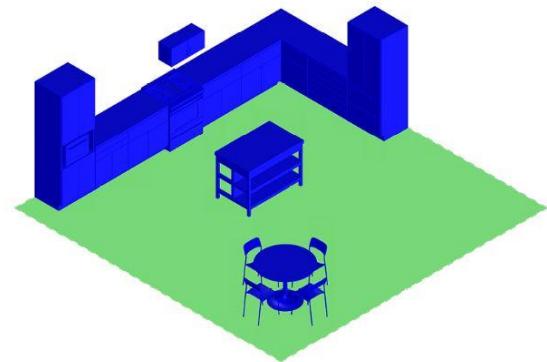
IKEA Display Typologies



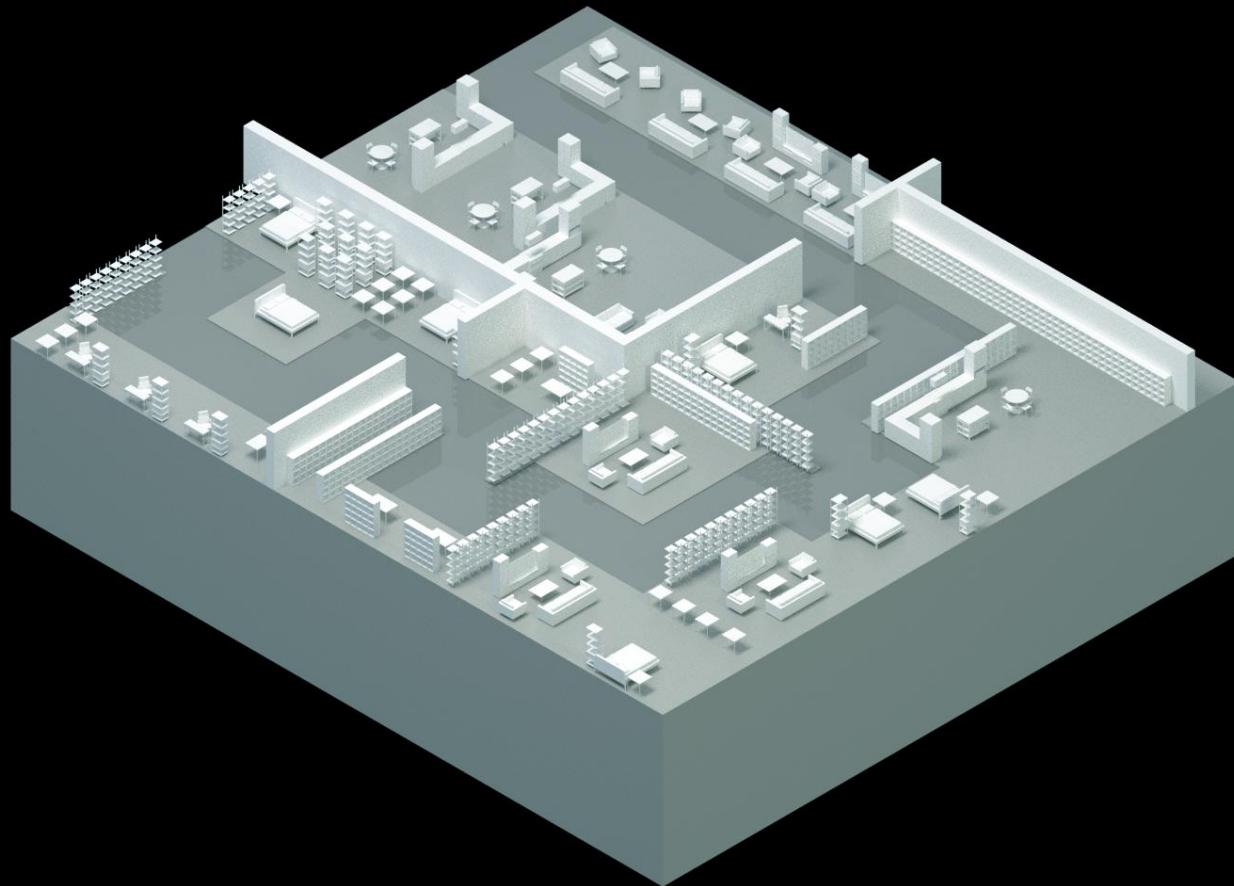
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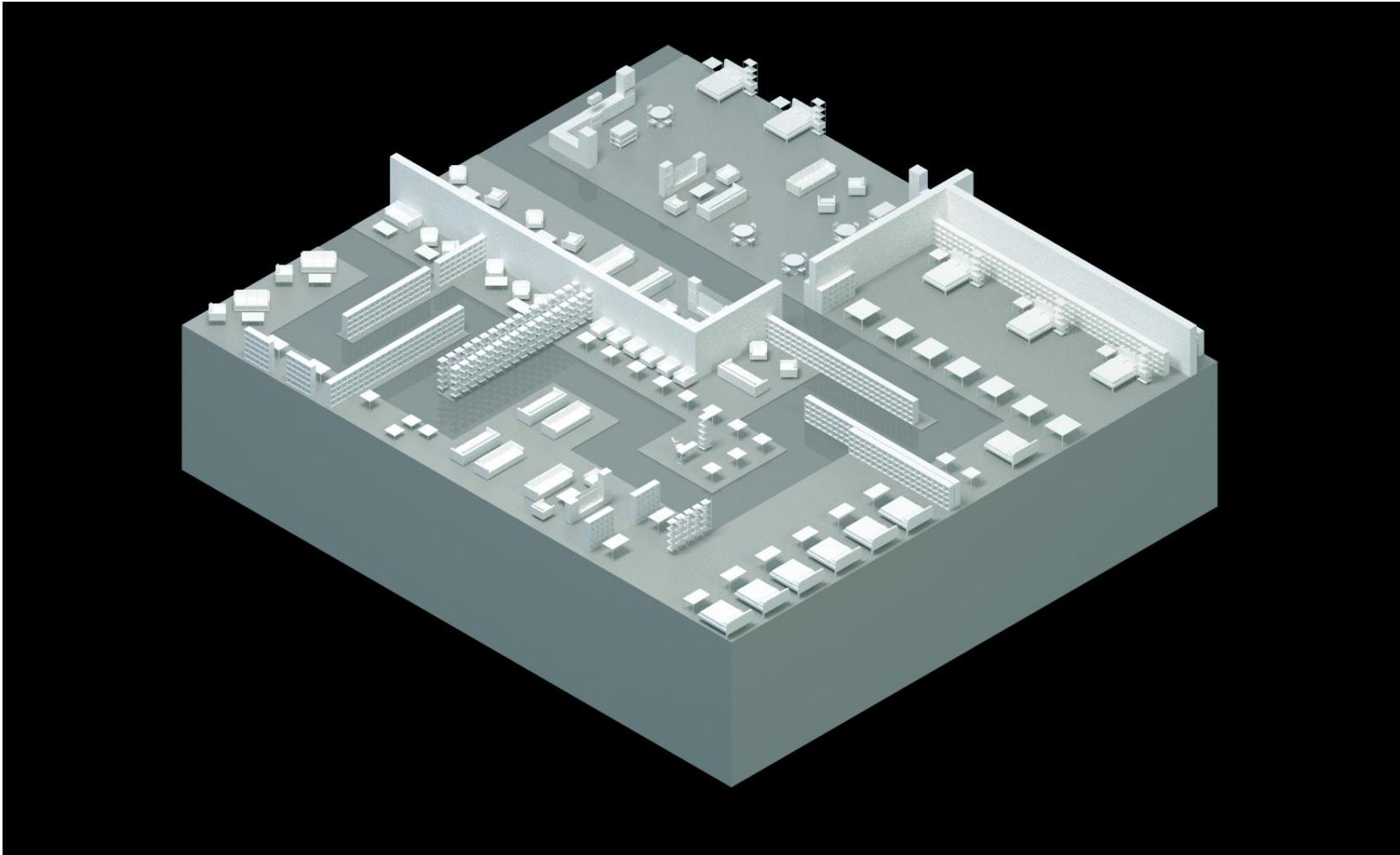


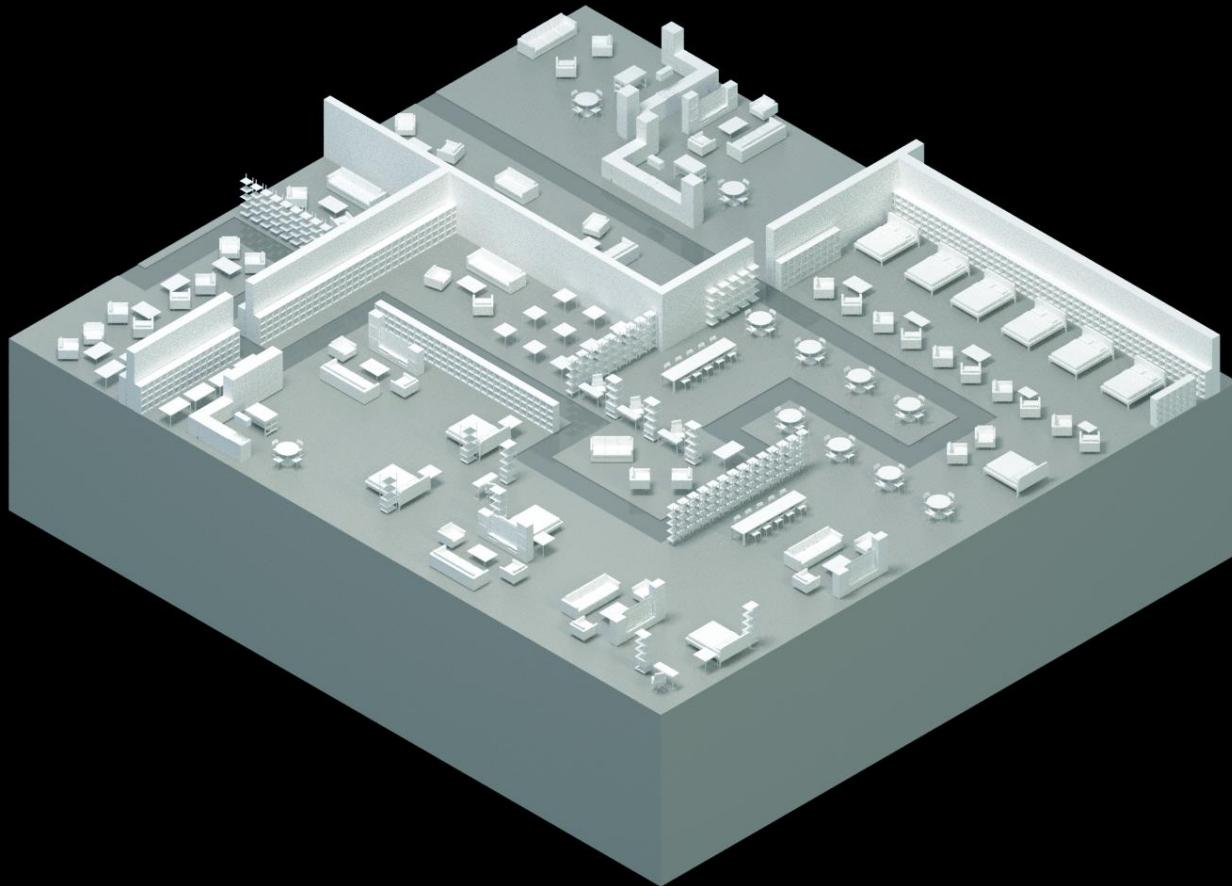
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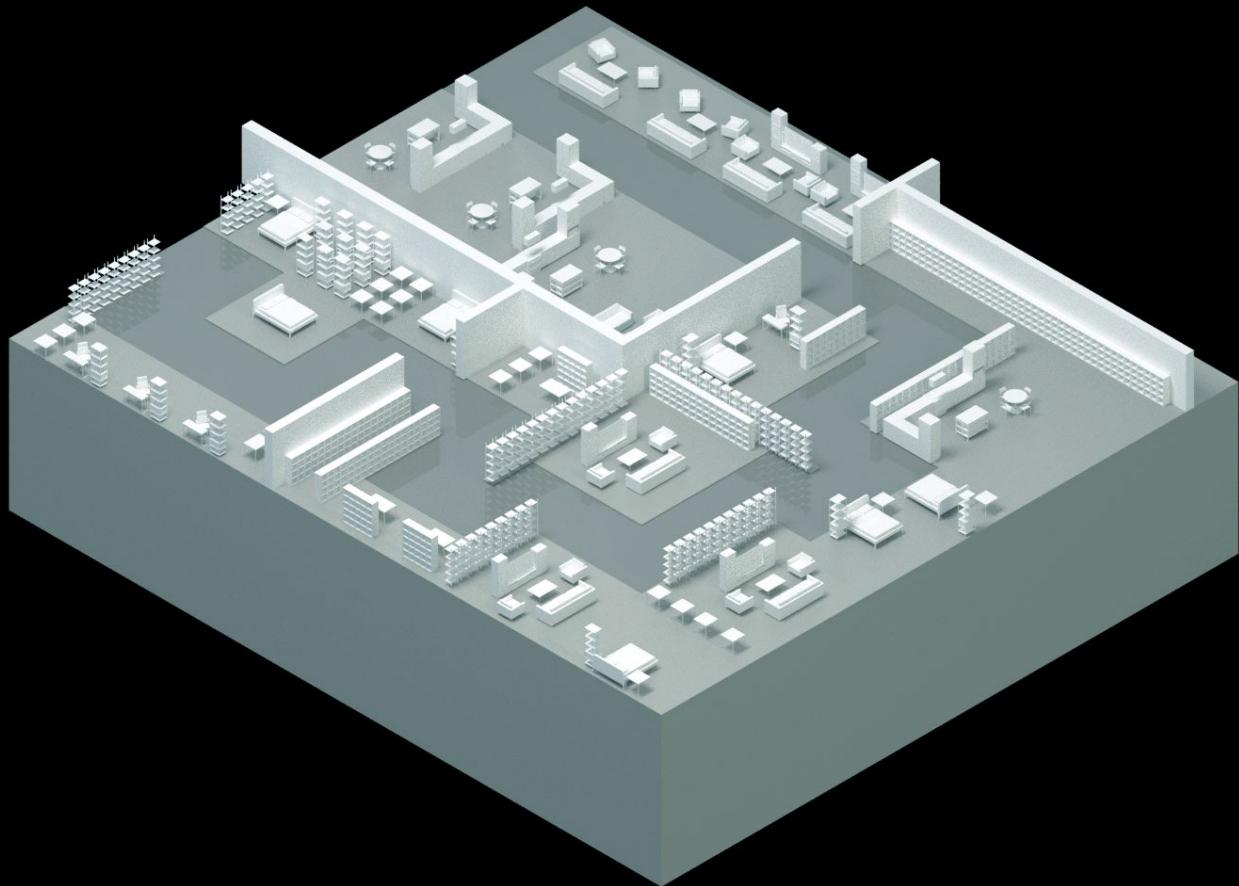


20x20 - XL Room or Full Living Scene











Opportunities and Constraints

Reflection Future IKEA Potential

Furniture Layouts

1. Could create the option to select individual squares and a specific layout typology to fill that space

Optimize for time in store

1. Add in a metric for time in store.
2. Some layouts might be too long or too short, could use real world testing to define the range that is optimal for IKEA sales

Create a density option

1. Allow designers to create spaces that are more or less broken-up
2. Give more agency to designers when programming areas that need to house more displays per retail requirements

Reflection Shortcomings

Need to incorporate structure and systems

1. Real world elements such as the structural grid could be included in later iterations
2. Constraints such as lighting, HVAC, life-safety could be added

Odd shaped stores

1. Not every IKEA is a rectangle or a perfect square

Unusable display areas

1. Need to optimize algorithm to remove display areas that stack in front of each other
2. Could provide a hierarchy from the circulation corridor

Reflection Future OTHER Potential

Urban design

1. Instead of a retail experience, this could be an urban corridor
2. Squares could be literal city blocks, form based-typology limited by lot size

Other retailers

1. Could easily be adapted to fit another retailer's model
2. Might be used to understand the capacity of speculative property based on interior layouts

Facade design

1. Slight abstraction of idea could be used to create a facade pattern based on travel or service corridor
2. Modification from display typology to material or opening type, other facade elements

Thank you!

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