INSY 437 - Managing Data & Databases
Dominique Welt

Database Design and Implementation for IKEA's Online Presence

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IKEA Canada
Team 1's proposal for a new Data Handling Strategy
April 19th, 2023

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SECTION 1: Project Scope and Planning

IKEA Business Scenario

IKEA is a multinational furniture retailer known for its affordable and stylish home furnishing products. Last year, the Canadian Branch recorded $2.6 Billion in sales of which 25% came from IKEA's online platform[1]. The scope of this project will be limited to only the online presence of IKEA, which is primarily done through its website, and therefore will not extend to physical store locations or other aspects of the company's operations. By focusing solely on the online presence, Team 1 can ensure that the database is optimized for the specific needs of e-commerce websites and can efficiently manage and store the vast amounts of data generated by IKEA's online operations. Additionally, by limiting the scope of the project to the online presence, the solutions were assured to be tailored to the unique challenges and opportunities of the digital marketplace, ultimately providing IKEA with a competitive advantage in the online furniture retail space. Further, to keep our focus narrow, the analysis has been limited to the three main categories of furniture items that IKEA is most known for: chairs, beds, and tables. This is done in order to deliver comprehensible and actionable insights that are applicable to IKEA's online operations.

The company's online website provides customers with a convenient and accessible way to browse and purchase products without having to physically visit a store. It serves as a virtual showroom, allowing customers to view IKEA's entire product line and access detailed product information, including pricing, dimensions, and available colors and materials. Customers can also place and track their orders through the website.

One of the key advantages of the IKEA online website is its ability to reach a global audience. By offering localized versions of the website in different languages and currencies, the company can cater to customers in different parts of the world, providing them with a personalized and relevant shopping experience. In addition, the online website has helped IKEA expand its customer base beyond those who live near physical store locations. By providing a convenient and hassle-free way to shop for furniture, the company has been able to attract customers who may not have otherwise considered purchasing from IKEA. A further benefit of the IKEA online website, which plays into its strategic business plan, is its ability to collect customer data and generate insights. By tracking customer behavior and preferences, the company can use this data to improve its product offerings and marketing strategies, ultimately driving sales and revenue growth in the long run.

1.*Source*: IKEA Canada 2022 Summary Report

This project aims to create a database that can support IKEA's online business processes and functionalities. The database is essential to IKEA's digital platform as it helps to manage and store the large volume of data generated by the website, such as customer information, product information, and online transactions.

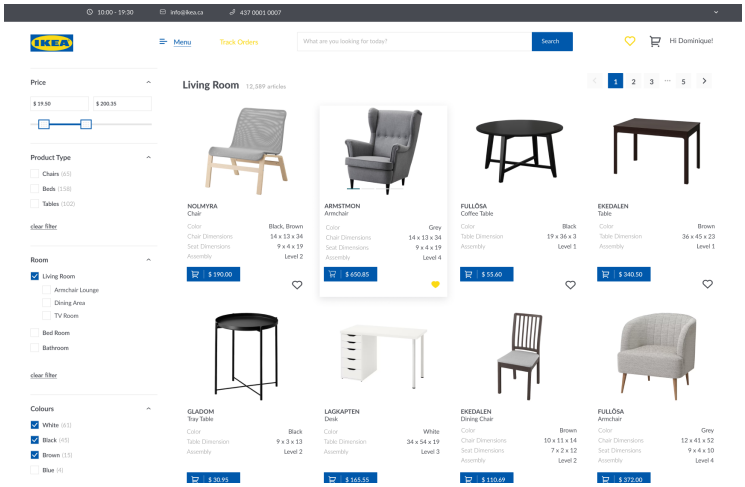
There are some reasons why a solid database is necessary for the good functional well-being of the website:

1. A robust database will allow IKEA's website to efficiently store and retrieve large amounts of data, ensuring that the website runs smoothly and quickly. Efficient management is crucial for e-commerce operations like IKEA, which must handle a high volume of transactions and customer data.
2. The database will help improve customer’s experience on IKEA's interface. The website can ensure that customers have access to up-to-date information about the products they are interested in and purchase them without any issues.
3. A well-defined database would allow IKEA to gather insights into its operations through simple and efficient queries.
4. The database will ensure the security of IKEA's digital operations and protect its customers' sensitive data, such as personal information and payment details.

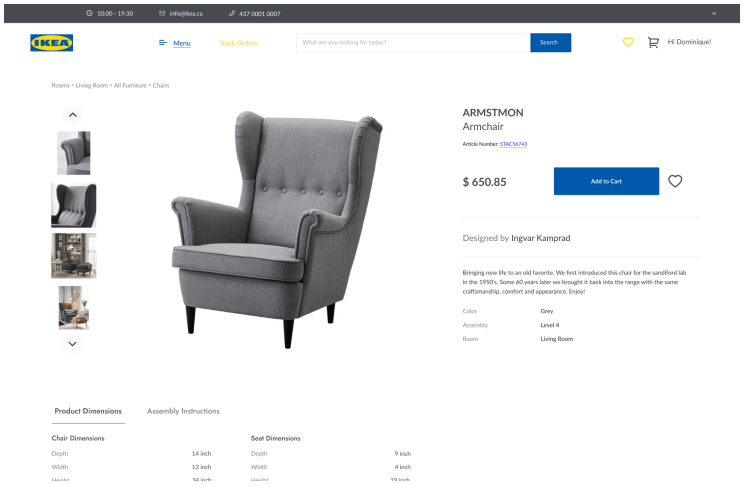
A secure database can prevent unauthorized access to this information, reducing the risk of data breaches and cyber-attacks.

Sample Wireframe Mockups

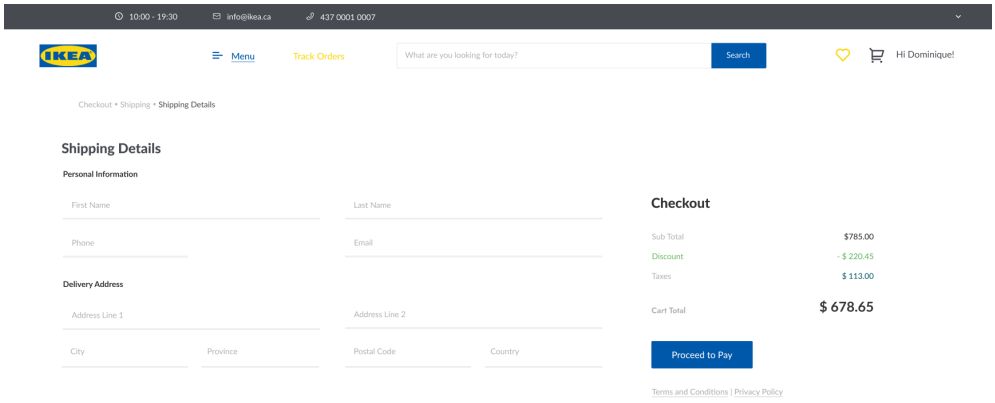
1. Browse Page



2. Product Page



3. Sign Up Page



Mission Statement & Objectives

Mission Statement:
The purpose of this database is to support IKEA's website operations and maintenance by providing granular data on its customers and their respective orders.

Objectives:
To maintain (enter, update, and delete) data on products
To maintain (enter, update, and delete) data on categories
To maintain (enter, update, and delete) data on customers
To maintain (enter, update, and delete) data on orders

To support product catalog management
To support customer management
To support order management

To perform searches on products
To perform searches on orders
To perform searches on customers

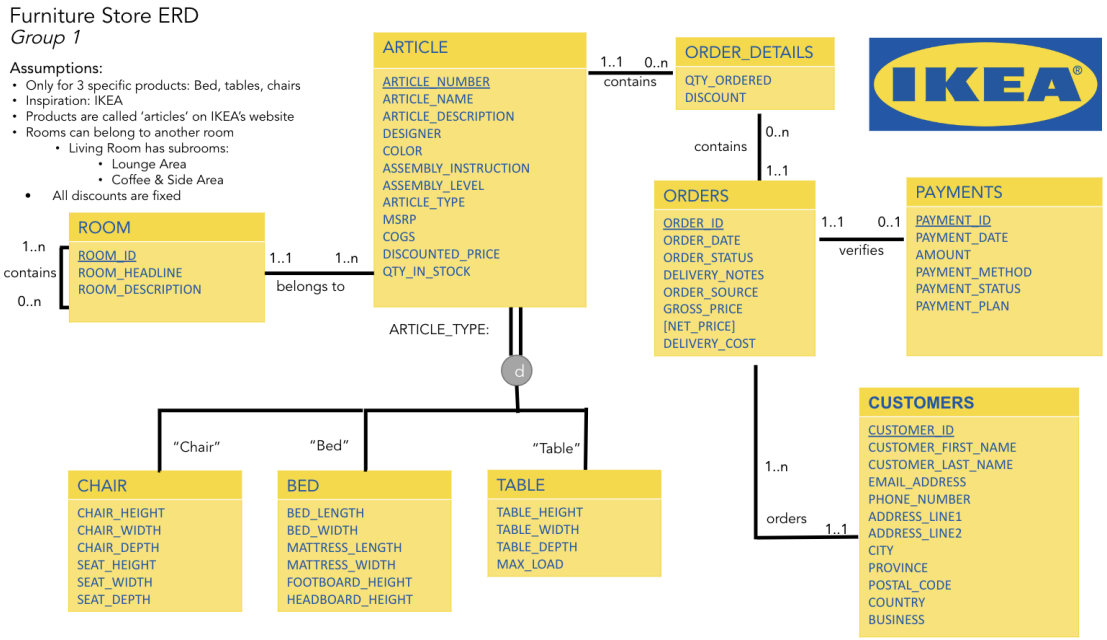
To report on products
To report on orders
To report on customers

To integrate payment gateways and safely process payments

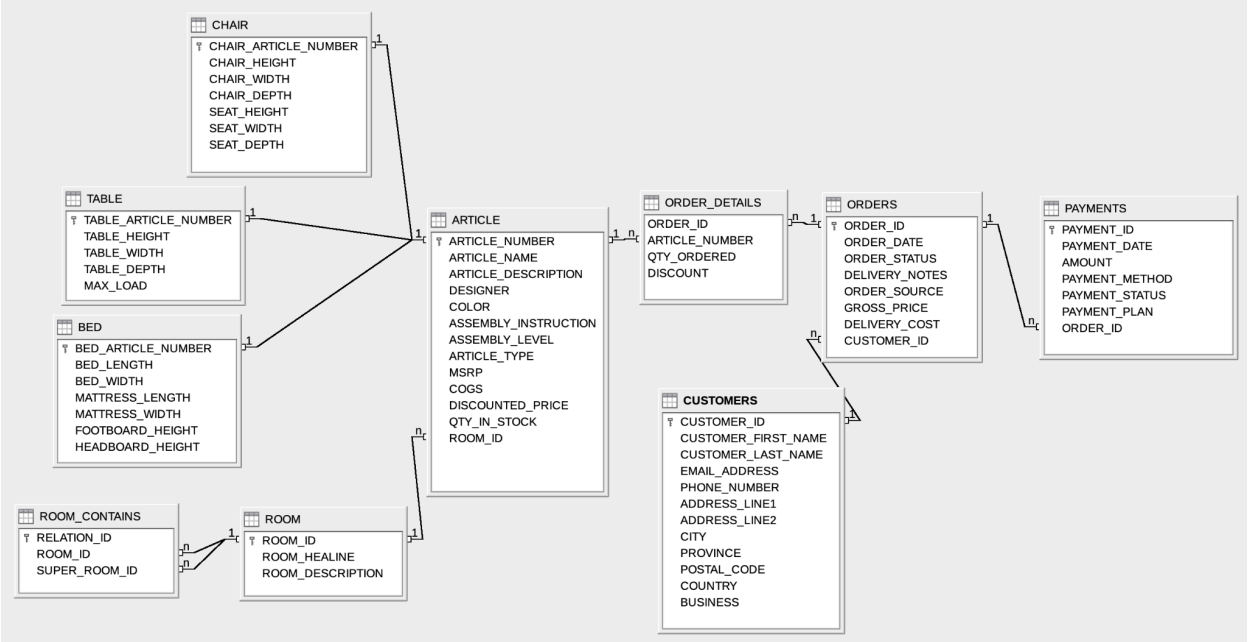
SECTION 2: Models

Room Definition: A room is the term IKEA uses to describe a category of articles. IKEA organizes their articles in rooms on their website in a similar fashion to their physical stores. More on this in *Section 4: Sample Graph.*

Enhanced ERD



In ODB Relational Model



Relational Model

CUSTOMERS(CUSTOMER_ID, CUSTOMER_FIRST_NAME, CUSTOMER_LAST_NAME, EMAIL_ADDRESS, PHONE_NUMBER, ADDRESS_LINE1, ADDRESS_LINE2, CITY, PROVINCE, POSTAL_CODE, COUNTRY, BUSINESS?)
PK: CUSTOMER_ID

ORDERS(ORDER_ID, ORDER_DATE, ORDER_STATUS, DELIVERY_NOTES, ORDER_SOURCE, GROSS_PRICE, DELIVERY_COST, CUSTOMER_ID)
PK: ORDER_ID
FK: CUSTOMER_ID References CUSTOMERS(CUSTOMER_ID)

PAYMENTS(PAYMENT_ID, PAYMENT_DATE, AMOUNT, PAYMENT_METHOD, PAYMENT_STATUS, PAYMENT_PLAN, ORDER_ID)
PK: PAYMENT_ID
FK: ORDER_ID References ORDERS(ORDER_ID)

ROOM(ROOM_ID, ROOM_HEADLINE, ROOM_DESCRIPTION)
PK: ROOM_ID

ARTICLE(ARTICLE_NUMBER, ARTICLE_NAME, ARTICLE_DESCRIPTION, DESIGNER, COLOR, ASSEMBLY_INSTRUCTION, ASSEMBLY_LEVEL, ARTICLE_TYPE, MSRP, COGS, DISCOUNTED_PRICE, QTY_IN_STOCK, ROOM_ID)
PK : ARTICLE_NUMBER
FK: ROOM_ID References ROOM(ROOM_ID)

CHAIR(CHAIR_ARTICLE_NUMBER, CHAIR_HEIGHT,CHAIR_WIDTH, CHAIR_DEPTH, SEAT_HEIGHT, SEAT_WIDTH, SEAT_DEPTH)
PK : CHAIR_ARTICLE_NUMBER
FK: CHAIR_ARTICLE_NUMBER References ARTICLE(ARTICLE_NUMBER)

BED(BED_ ARTICLE_NUMBER, BED_LENGTH, BED_WIDTH, MATTRESS_LENGTH, MATTRESS_WIDTH, FOOTBOARD_HEIGHT, HEADBOARD_HEIGHT)
PK : BED_ARTICLE_NUMBER
FK: BED_ARTICLE_NUMBER References ARTICLE(ARTICLE_NUMBER)

TABLE(TABLE_ARTICLE_NUMBER, TABLE_HEIGHT, TABLE_WIDTH, TABLE_DEPTH, MAX_LOAD)
PK : TABLE_ARTICLE_NUMBER
FK: TABLE_ARTICLE_NUMBER References ARTICLE(ARTICLE_NUMBER)

ORDER_DETAILS(ARTICLE_NUMBER,ORDER_ID,QTY_ORDERED, DISCOUNT?)
PK: ARTICLE_NUMBER, ORDER_ID
FK: ARTICLE_NUMBER References ARTICLE(ARTICLE_NUMBER)
FK : ORDER_ID References ORDERS(ORDER_ID)

ROOM_CONTAINS(RELATION_ID, ROOM_ID, SUPER_ROOM_ID)
PK: RELATION_ID
FK: ROOM_ID References ROOM(ROOM_ID)
FK: SUPER_ROOM_ID References ROOM(ROOM_ID)

Data Dictionary

Table 1: Description of the Entities

Entity	Description	Occurrence
Room	Characteristics of each display of complementary products (IKEA uses *Room* to describe a category of articles)	Each room represents a single occurrence A room contains at least one article and may belong to 1 or 0 other rooms
Article	Uniform characteristics of each product available for purchase	Each article represents a single occurrence An article belongs to at least one room, has a specific product type, and can be involved in many orders
Chair	Unique chair dimensions	Each article represents a single occurrence and is a unique product type
Bed	Unique bed dimensions	Each bed represents a single occurrence and is a unique product type
Table	Unique table dimensions	Each table represents a single occurrence and is a unique product type
Orders	Orders placed by customers	Each order can have multiple occurrences Orders are placed by one customer, can contain multiple articles, and is verified by at most one payment. It is possible that placed orders have not yet been paid for
Order_Details	Product-related information of each order	Order details can have multiple occurrences Order details are associated with each article in each order

Payments	Payment information associated with each order	Each payment can have multiple occurrences A payment verifies each order
Customers	Characteristics of each customer	Each customer represents a single occurrence A customer has placed at least one order previously

Note: Only three product types included for simplicity: Beds, tables, and chairs

Table 2: Description of the Attributes

Entity	Attribute	Description	Data Type	Nulls	Multi-valued	Derived	Composite	Default
Room	Room_Id	Unique identifier of room	Integer	-	-	-	-	-
	Room_Headline	Title of room		-	-	-	-	-
	Room_Description	Description of room	Text	-	-	-	-	-
Article	Article_Name	Name of article	Varchar(50)	-	-	-	-	-
	Article_Description	Description of article	Text	-	-	-	-	-
	Designer	Name of designer	Varchar(50)	-	-	-	-	-
	Color	Main color of article	Varchar(50)	-	-	-	-	-
	Assembly_Instruction	Step-by-step directions to amble specific article, including images	Text					
	Assembly_Level	Difficulty level of assembly (discrete scale from 1-5)	Integer	-	-	-	-	-
	Article_Type	Type of article (chair, bed, or table)	Varchar(50)	-	-	-	Yes	-
	MSRP	Price that article is sold for	Float	-	-	-	-	-

	COGS	Cost of article that IKEA incurs	Float	-	-	-	-	-
	Discounted_Price	Discounted price of article (null if no discount)	Float	Yes	-	-	-	-
	Quantity in stock	Amount of article available for purchase	Integer	-	-	-	-	-
Chair	Chair_Height	Vertical distance between floor and top of backrest, in inches	Float	-	-	-	-	-
	Chair_Width	Horizontal distance between left and right outermost edges of chair, in inches	Float	-	-	-	-	-
	Chair_Depth	Horizontal distance between front and back outermost edges of chair, in inches	Float	-	-	-	-	-
	Seat_Height	Vertical distance between floor and front edge of seating area, in inches	Float	-	-	-	-	-
	Seat_Width	Horizontal distance between right and left edges of seating area, in inches	Float	-	-	-	-	-
	Seat_Depth	Horizontal distance between front edge of seat and backrest, in inches	Float	-	-	-	-	-
Bed	Bed_Length	Horizontal distance between front and back outermost edges of bed, in inches	Float	-	-	-	-	-
	Bed_Width	Horizontal distance between left and right outermost edges of bed, in inches	Float	-	-	-	-	-
	Mattress_Length	Horizontal distance between front and back edges of mattress, in inches	Float	-	-	-	-	-

	Mattress_Width	Horizontal distance between left and right edges of mattress, in inches	Float	-	-	-	-	-
	Footboard_Height	Vertical distance between floor and top of footboard, in inches	Float	-	-	-	-	-
	Headboard_Height	Vertical distance between top of footboard and top of headboard, in inches	Float	-	-	-	-	-
Table	Table_Height	Vertical distance between floor and top of table surface, in inches	Float	-	-	-	-	-
	Table_Width	Horizontal distance between left and right edges of table surface, in inches	Float	-	-	-	-	-
	Table_Depth	Horizontal distance between front and back edges of table surface, in inches	Float	-	-	-	-	-
	Max_Load	Amount of weight table can support, in pounds	Float	-	-	-	-	-
Orders	Order_ID	Unique identifier of order	Float	-	-	-	-	-
	Order_Date	Specific date and time the order was placed	Datetime	-	-	-	-	-
	Order_Status	Status of order (placed, out for delivery, delivered, received)	Varchar(50)	-	-	-	-	-
	Delivery_Notes	Additional delivery instructions made by customers (leave at door, ring when here, beware of barking dog, etc.)	Varchar(50)	-	-	-	-	-
	Order_Source	Platform or Campaign to which the order may be attributed to	Varchar(50)	-	-	-	-	-

	Net_Price	Total price of order excluding taxes (either MSRP or Discounted Price)	Float	-	-	Yes	-	-
	Gross_Price	Total price of order including taxes	Float	-	-	-	-	-
	Delivery_Cost	Cost incurred by IKEA to deliver article to customers	Float	-	-	-	-	-
Order_Details	Qty_Ordered	Number of units ordered of each article	Float	-	-	-	-	-
	Discount	Whether discount is applied to article in order or not	Boolean	-	-	-	-	-
Payments	Payment_Id	Unique identifier of payment	Integer	-	-	-	-	-
	Payment_Date	Specific date and time the payment was processed	Datetime	-	-	-	-	-
	Amount	Total monetary value before taxes	Float	-	-	-	-	-
	Payment_Method	Method of payment (credit, debit, PayPal)	Varchar(50)	-	-	-	-	-
	Payment_Status	Status of payment (pending, complete, refunded, failed)	Varchar(50)	-	-	-	-	-
	Payment_Plan	Type of payment plan the customer will follow (installments, lump sum)	Varchar(50)	-	-	-	-	-
Customers	Customer_Id	Unique identifier of customer	Integer	-	-	-	-	-
	Customer_First_Name	First name of customer	Varchar(50)	-	-	-	-	-
	Customer_Last_Name	Last name of customer	Varchar(50)	-	-	-	-	-

Email _Address	Preferred email address	Varchar(100)	-	-	-	-	-
Phone	Preferred telephone number	Integer	-	-	-	-	-
Addressline1	Primary address information (street number, street name, apartment number)	Varchar(100)	-	-	-	-	-
Addressline2	Secondary address information (building name, floor number)	Varchar(100)	Yes	-	-	-	-
City	City of residence	Varchar(50)	-	-	-	-	-
Province	Province or territory of residence	Varchar(50)	-	-	-	-	-
Postalcode	Postal code of residence	Varchar(7)	-	-	-	-	-
Country	Country of residence	Varchar(6)	-	-	-	-	-
Business	Whether the customer is a retail shopper or a business client	Varchar(50)					

Note: Product type dimensions are displayed as standard measures; product types may be adjustable

SECTION 3: Database Exploitation

Note on the creation of the Database:
For convenience and future scaling purposes, both CUSTOMER_ID and RELATION_ID were auto incremented. While in other SQL query softwares, the following queries could have been used to apply an auto-incrementation at the creation of the attributes:

ALTER TABLE CUSTOMERS MODIFY CUSTOMER_ID INT AUTO_INCREMENT;
or
ALTER TABLE CUSTOMERS MODIFY CUSTOMER_ID INT IDENTITY(1,1);

LibreOffice Base cannot read these features. Therefore, the values were changed to auto-value manually within the ODB database by switching AutoValue on under the Field Properties. This must be done before any foreign key relation queries are applied. The rest of the code can be run at once.

Functional SQL Statements

Ref Number	01
Description	This query obtains a list of products with prices between two thresholds selected by the customer
Situational Context	When browsing for products, the user may want a set of products with specific prices
Situational Parameter	User is interacting with the filter tool

Ref Number	02
Description	This query obtains a list of products in a specific digital room selected by the customer
Situational Context	When browsing for products, the user may want a set of products from a digital room
Situational Parameter	User is interacting with the filter tool

Ref Number	03

Description	This query obtains a list of products with colors chosen by the customer
Situational Context	When browsing for products, the user may want a set of products with specific colors
Situational Parameter	User is interacting with the filter tool

Ref Number	04
Description	This query obtains a list of all orders executed by the customer, including canceled ones
Situational Context	When looking for specific details from past orders, the user is checking their order history
Situational Parameter	User is interacting with the orders tab

Ref Number	05
Description	This query cancels an order made by a particular user
Situational Context	User decides to cancel their order that is on its way
Situational Parameter	User is interacting with the orders tab

Informational SQL Queries

Ref Number	06
Description	This query obtains the month in 2023 with the most sales
Value	Allows to determine the best-selling month of the year. This can be coupled with context information. For example, IKEA ran an advertisement campaign in the previous month, and it is looking to see if it made an impact.

Preview:

	MONTH	YEAR	TOTAL_SALES
▸	3	2023	38795.18

Ref Number	07
Description	This query obtains the 2 most popular articles sold based on quantity ordered for a given period.
Value	Understand which products are making the biggest impression on customers over the past days, months, or years.

Preview:

	ARTICLE_NAME	QUANTITY
▸	LACK Side table	1000
	POÄNG	2

Ref Number	08
Description	This query provides the name of the customer who canceled the most orders and the number of orders canceled.
Value	Identifies customers that have been unsatisfied with the order experience. More details on said customer may reveal churn trends amongst the customer base.

Preview:

	CUSTOMER_ID	CUSTOMER_NA...	CANCELLED_OR...
▸	1	Teghwin Kohli	1

Ref Number	09
Description	This query obtains a list of 5 most valuable customers, in terms of total amount spent
Value	Can create marketing campaigns to target new customers with similar characteristics. Additionally, IKEA could reward said customers for their loyalty with the company, which can further increasing their spending

Preview:

	CUSTOMER_ID	CUSTOMER_NA...	ORDER_VALUE
▶	5	Tom Hutchinson	27988.8
	1	Teghwin Kohli	10604.14
	0	Dominique Welt	2651.9
	3	Jon Stinbourg	174
	4	Luis Ruingator	28.24

Ref Number	10
Description	This query obtains a list of customers who have not placed an order in March 2023
Value	This information can help better understand the churn rate within the company's customer base and implement strategies to retain them

Preview:

	CUSTOMER_NA...
▶	Dominique Welt
	Tom Hutchinson

Ref Number	11
Description	This query obtains a list of products and the average quantity ordered.
Value	Provides insight on customer preferences and can assist the supply chain department with inventory management

Preview:

	ARTICLE_NUMBER	ARTICLE_NAME	AVERAGE_QUAN...
▶	70319028	LACK Side table	500
	69009475	MALM Bed frame	25
	49306570	POÄNG	1
	30449908	LACK Side table	1
	19495204	MÖRBYLÅNGA / LIL	1

Ref Number	12
Description	This query obtains a list of orders which have an order quantity higher than the average order quantity for that particular article
Value	IKEA can use this information to reward their spending habits through marketing initiatives. The company could also promote higher quantities of another particular product to said customers.

Preview:

	ORDER_ID	NAME	ARTICLE_NUMBER	QTY_ORDERED	AVERAGE_ORDE...
▶	101	Dominique Welt	49306570	2	1
	109	Tom Hutchinson	70319028	1000	500

Ref Number	13
Description	This query obtains a list of payment methods and the maximum order value for each method
Value	IKEA could use this information to understand which methods are more used in terms of transaction value and improve the backend infrastructure of processing such payments. Alternatively, the company could use this query for fraud detection.

Preview:

	PAYMENT_METH...	NUM_PAYMENTS	MAX_ORDER_VA...
▶	VISA	2	10604.14
	Mastercard	2	2651.9
	Cheque	1	27988.8

Ref Number	14
Description	This query obtains the total amount of orders by the difficulty of assembly
Value	This query helps IKEA understand if there is a correlation between the difficulty of assembly and the popularity of a product. The company could promote its help desk phone line more if they conclude that the difficulty of assembly is affecting its sales. Alternatively, they could make their products easier to assemble.

Preview:

	ASSEMBLY_LEVEL	TOTAL_ORDERS
▶	High	26
	Low	1002
	Medium	3

Ref Number	15
Description	This query obtains the proportion of discounted and non-discounted products
Value	IKEA will be able to assess if they are offering too many discounts.

Preview:

	DISCOUNTED_O...	NON_DISCOUNT...
▶	0.43	0.57

SECTION 4: Future Improvements

MDDB design table

Transaction Question: *What was the profit margin per product line for Western Canada (BC, AB, SASK, and MAN) business customers from the business-targeted social media campaigns in the past month (March 2023)?*

Why was this question selected?

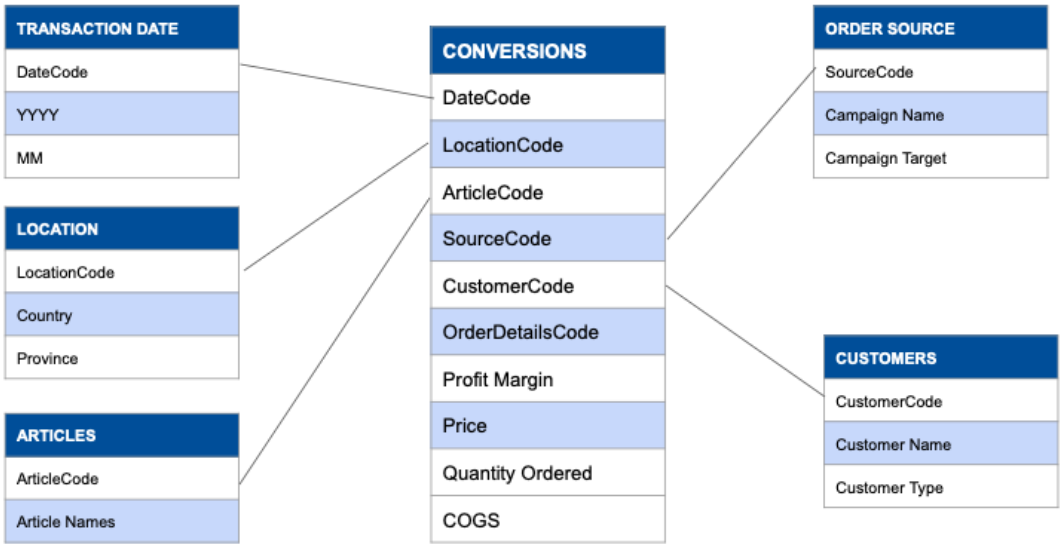
The objective of the STAR model is to provide relevant insight quickly to the business user that complements its business objectives. The marketing department would benefit the most from quick insights at IKEA as it is a critical component of their success and many marketing insights can be retrieved with a small amount of features (e.g., filtering by region, channel, etc.). In addition, data privacy concerns mitigation (minimize data irrelevant to marketing e.g., payment), and with the department being less data literate (therefore minimizing the complexity of their available data) furthers the cause for the department.

For this example, a very specific question was chosen to show how in-depth questions can be by tackling all dimensions of the MDDB design table. More granularly, here is why the specific components in the transaction question were chosen. First, IKEA currently focuses on personal sales, leaving behind a major segment of customers: businesses. Nowadays, a common and cost-friendly method to attract customers is through the use of targeted marketing channels. These mediums enable companies to send links to specific consumers and then track the sales (conversion) made from this link. The Western provinces of Canada were chosen since it is the fastest-growing region in Canada (Statistics Canada). The past month was selected since IKEA would want to see the most recent and up to date campaigns success.

Therefore, our STAR model would enable IKEA executives to quickly understand which campaigns are successful at bringing revenue and for which product line it is having success (since these campaigns are often specific to a product). IKEA will then have more information to tailor their marketing campaigns in the future and possibly attract more business consumers at a low cost.

Prompt	Answer Elements	Examples	Data Source
Outcome	Profit Margin (Price, Quantity, Cost of Goods Sold)	18%	ORDERS table, ORDER_DETAILS table, and ARTICLES table
When	Order Date (YYYY-MM)	2023-03	ORDERS table
Where	Customer Location (Country, Province)	CA, AB	CUSTOMERS table
What	Product Lines	Chairs	ARTICLES table
How	Order Source (Campaign Name, Campaign Target)	Instagram Influencer campaign, Business	ORDERS table
Who	Customer Profile (Name, Type)	Gowling WLG, Business	CUSTOMERS table

Star Model



Star Model Tables

Conversions Fact Table: Stores information about marketing campaign success. One atomic fact represents each business marketing campaign order details (articles ordered) per product line.

Transaction Date Dimension Table: Stores information about the date (Year and Month) of orders

Location Dimension Table: Stores information about customer location according to their billing address.

Article Dimension Table: Stores information about the different product lines available for purchase.

Order Source Dimension Table: Stores information about the ongoing marketing campaigns channels and to who they are targeted.

Customer Dimension Table: Stores information about each customer to know if they are registered as a personal or business customer.

Metadata

Name	**Quantity Ordered**
Description	Determines the quantity of a product ordered for a specific order
Purpose	Allows to measure the quantity sold for a product to identify bestsellers and weak performers
Formula	Information in ERD, quantity of a specific product ordered
Data Source	Order Details table in ERD

Name	**Selling Price**
Description	Calculates the selling price of a product after discount (if any)
Purpose	To determine the actual selling price for accurate revenue calculation
Formula	MAX{MSRP*(1 - DISCOUNT), Discounted_Price}
Data Source	MSRP: Articles table in ERD Discounted Price: Articles table in ERD DISCOUNT: Order_Details in ERD

Name	**Cost of Goods Sold**
Description	Determines the cost of good sold (COGS) of the products ordered
Purpose	Allows to find the COGS of products attached to each orders
Formula	Information in ERD, COGS of products
Data Source	Articles table in ERD

Name	**Profit Margin**
Description	Determines the profit margin on a product
Purpose	Allows to compare profitability of different product, product lines, or rooms
Formula	(Selling_Price - COGS) / COGS
Data Source	Selling Price: Calculated Measure COGS: Articles table in ERD

Nodes and Relationship Diagram

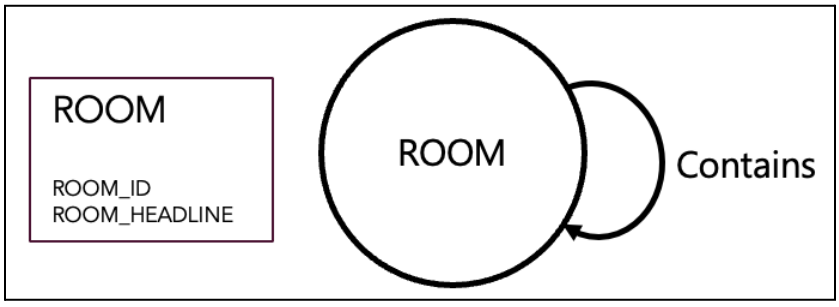
Description:
We have chosen to conduct our graph database analysis on the room entity and its unary relationship "contains." A room is the term IKEA uses to describe a category of articles. IKEA organizes their articles in rooms on their website in a similar fashion to their physical stores. When customers click on the rooms tab, they are prompted to select from an array of rooms. Clicking on each room will bring the customer to a new display of rooms to choose from. This process repeats itself until the customer drills down far enough to be shown an array of products. The room is used to cater to the specificity of each customer's desired articles.

Simplifying Example:
In our example, we focus on three main rooms: *bedroom, living room, and home office*. If a customer clicks on *bedroom*, they will be prompted to four other rooms: *Beds*, *cabinets*, *tables*, and *shelves*. Clicking on beds prompts the customer to three more rooms: *King and queen beds*, *twin beds*, and *bunk beds*. Finally, if the customer clicks on *king and queen beds*, they will be shown an array of king and queen bed articles to choose from.

Super Rooms vs Rooms:
A super room is defined as a room that contains other rooms. In the above example, *bedroom* would be the super room of *beds*, and *beds* would be the super room of *king and queen beds*.

Many-to-Many Unary Relationship:
The room entity has a many-to-many unary relationship, meaning that different super rooms can contain rooms of the same type. For example, *bedroom* and *home office* both contain *cabinet* rooms, while *bedroom* and *living room* both contain *chair* rooms. An exhaustive list of these relationships can be found in the sample data below.

Nodes and Relationship Diagram



Sample Graph

Sample Data of Room Nodes

ROOM_ID	ROOM_HEADLINE
1	Bedroom
2	Beds
3	Tables
4	Cabinets
5	Shelving units
6	King & queen beds
7	Sofas & sofa beds
8	Twin beds
9	Bunk beds
10	Desks
11	Nightstands
12	Side tables
13	Dressers
14	Armoirs
15	Sideboards
16	Wall shelves
17	Display units
18	Bookcases
19	Living room
20	Chairs
21	Sleeper sofas
22	Leather sofas
23	Sectional sofas
24	Coffee tables
25	Consoles
26	Nesting tables
27	Arm chairs
28	Lounge chairs
29	Ottomans & footstools
30	Home office
31	Writing desks

32	Standing desks
33	L-shaped desks
34	Office chairs
35	Gaming chairs
36	Drawer units
37	Filing cabinets
38	Newspaper racks
39	Noticeboards
40	Magazine files

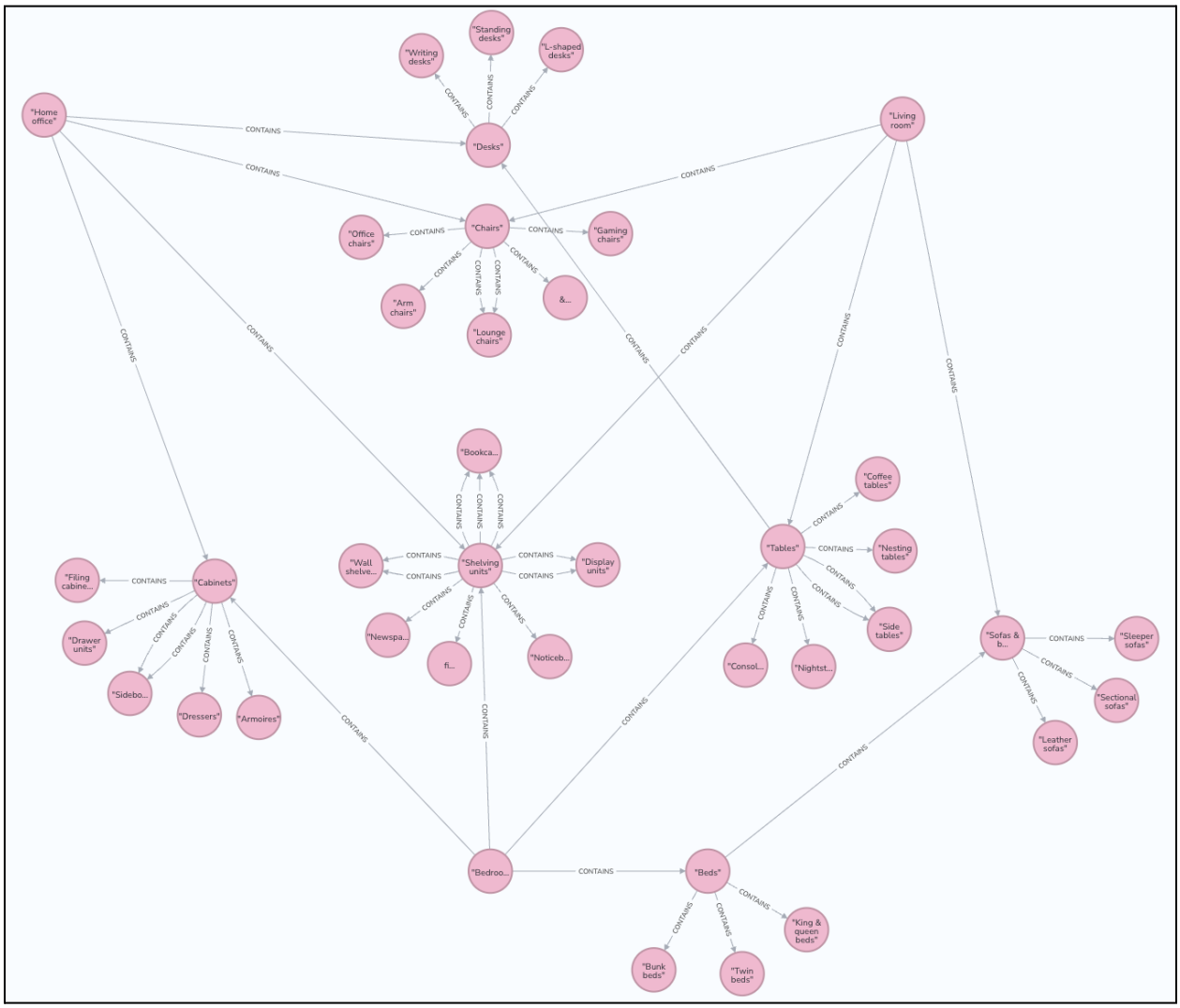
Sample Data of Contain Relationship

ROOM_ID	ROOM_HEADLINE	SUPER_ROOM_ID
1	Bedroom	N/A
2	Beds	1
3	Tables	1
4	Cabinets	1
5	Shelving units	1
6	King & queen beds	2
7	Sofas & sofa beds	2
8	Twin beds	2
9	Bunk beds	2
10	Desks	3
11	Nightstands	3
12	Side tables	3
13	Dressers	4
14	Armoirs	4
15	Sideboards	4
16	Wall shelves	5
17	Display units	5
18	Bookcases	5
19	Living room	N/A
7	Sofas & sofa beds	19
3	Tables	19
20	Chairs	19
5	Shelving units	19

21	Sleeper sofas	7
22	Leather sofas	7
23	Sectional sofas	7
12	Side tables	3
24	Coffee tables	3
25	Consoles	3
26	Nesting tables	3
27	Arm chairs	20
28	Lounge chairs	20
29	Ottomans & footstools	20
16	Wall shelves	5
17	Display units	5
18	Bookcases	5
30	Home office	N/A
10	Desks	30
20	Chairs	30
4	Cabinets	30
5	Shelving units	30
31	Writing desks	10
32	Standing desks	10
33	L-shaped desks	10
34	Office chairs	20
28	Lounge chairs	20
35	Gaming chairs	20
15	Sideboards	4
36	Drawer units	4
37	Filing cabinets	4
18	Bookcases	5
38	Newspaper racks	5
39	Noticeboards	5
40	Magazine files	5

The following network was produced by inputting the necessary cypher code creation statements in a Neo4j cloud blank sandbox. The cypher code to create this graph can be found in the SQL sample file.

Sample Network



Cypher Queries

The tables below describe and explain the value of our cypher queries, and display their output. The cypher queries were produced inputting the necessary statements in a Neo4j cloud blank sandbox and can be found in the SQL sample file under the reference numbers below.

Cypher Query #1 Description and Value

Reference Number	16
Description	Displays the amount of distinct room types that each super room has in descending order
Value	Provides the marketing department with increased visibility on room types so that they can add or remove certain room types depending on demand behaviors ● If sales for a certain super room are high, they may opt for increased variety and add more room types under the super room ● If sales for a certain super room type are low, they may opt for decreasing variety and remove room types under the super room

Cypher Query #1 Output

SUPER_ROOM	ROOM_TYPE_COUNT
Tables	6
Shelving units	6
Cabinets	5
Chairs	5
Bedroom	4
Beds	4
Living room	4
Home office	4
Sofas & sofa beds	3
Desks	3

Cypher Query #2 Description and Value

Reference Number	17

Description	Displays the amount of super rooms that are connected to each type of room
Value	Enables marketing department to identify the most accessible room types and determine which room types customers are likely to encounter most often in their searches

Cypher Query #2 Output

ROOM_TYPE	SUPER_ROOM_COUNT
Shelving units	3
Bookcases	3
Cabinets	2
Tables	2
Sofas & sofa beds	2
Side tables	2
Desks	2
Sideboards	2
Display units	2
Wall shelves	2
Chairs	2
Lounge chairs	2
Beds	1
Bunk beds	1
Twin beds	1
King & queen beds	1
Nesting tables	1
Consoles	1
Coffee tables	1
Nightstands	1
Drawer units	1

Filing cabinets	1
Armoires	1
Dressers	1
Noticeboards	1
Magazine files	1
Newspaper racks	1
Sectional sofas	1
Leather sofas	1
Sleeper sofas	1
Standing desks	1
Writing desks	1
L-shaped desks	1
Office chairs	1
Gaming chairs	1
Ottomans & footstools	1
Arm chairs	1

Closing Remarks from Team 1 Consulting

Our consulting firm, Team 1, recognizes the importance of creating a database that is capable of supporting IKEA's online operations. By focusing solely on the online presence of the company, we can ensure that the database is optimized for the unique challenges and opportunities of e-commerce websites. IKEA will be able to effectively manage, handle and retain the vast amounts of data generated by its online operations, ultimately providing the company with a competitive advantage in the online furniture retail market.

Team 1's mandate consists of creating a database that can support IKEA's website business processes and functionalities, and help manage and store the large volume of data such as customer information, product information, and online transactions. The robust database, marketing-tailored star schema model and room graphical relationship diagram proposed by Team 1's consultants will ensure that the website runs smoothly and allow IKEA to gather the most significant insights on its marketing and operations. Additionally, a secure database will protect the sensitive data of IKEA's customers, reducing the risk of data breaches and cyber-attacks.

Team 1 is committed to delivering a high-quality database solution that will contribute to the long-term success of IKEA's online operations.

Works Cited

Statistics Canada. “Population Projection for Canada (2021 to 2068), Provinces and Territories (2021 to 2043).” August 22, 2022. https://www150.statcan.gc.ca/n1/pub/91-520-x/91-520-x2022001-eng.htm. Accessed April 04 2023.