



ZARA

Team 7

Arham Anwar
Arnav Gupta
Kazuya Hayashi

PROBLEM STATEMENT



One of the top fast fashion retailers, Zara, deals with the problem of customer option overload as well as significant seasonal dead stock creation.



Objective: to create a chatbot that offers personalized fashion recommendations and efficiently resolves inventory-related challenges faced by both customers and the Zara team.



Company Description

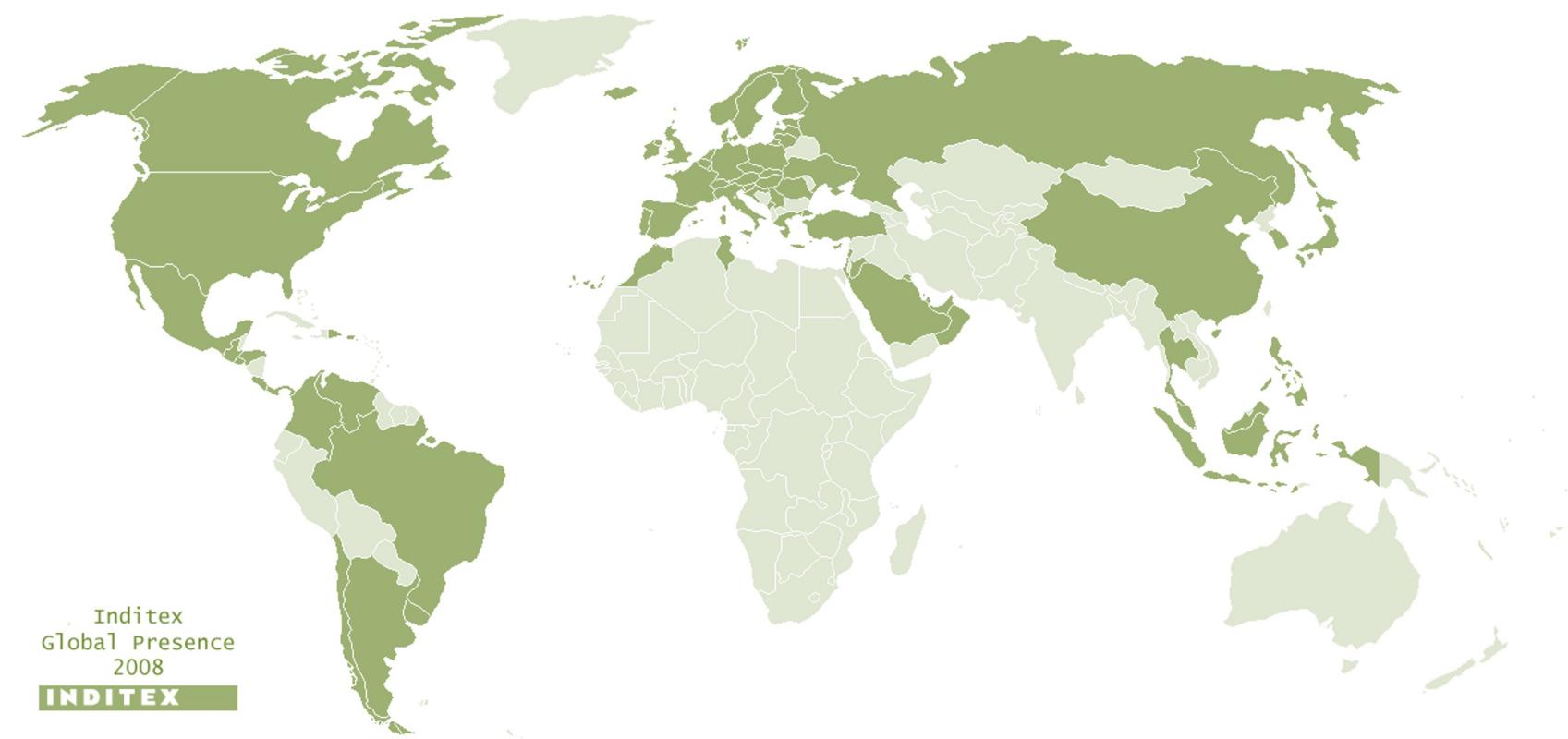
11%
Market Share

500+
New Designs/Week

4000+
Stores

96
Countries

26.7%
Deadstock Ratio



- Founded in **Spain** in 1974
- Market leader in fast fashion industry (**11% share**)
- Target: fashion-conscious individuals who seek trendy & affordable clothing options
- 500 new designs a week, or about 20,000 different styles a year
- 4000+ stores in 96 countries worldwide

RATIONALE

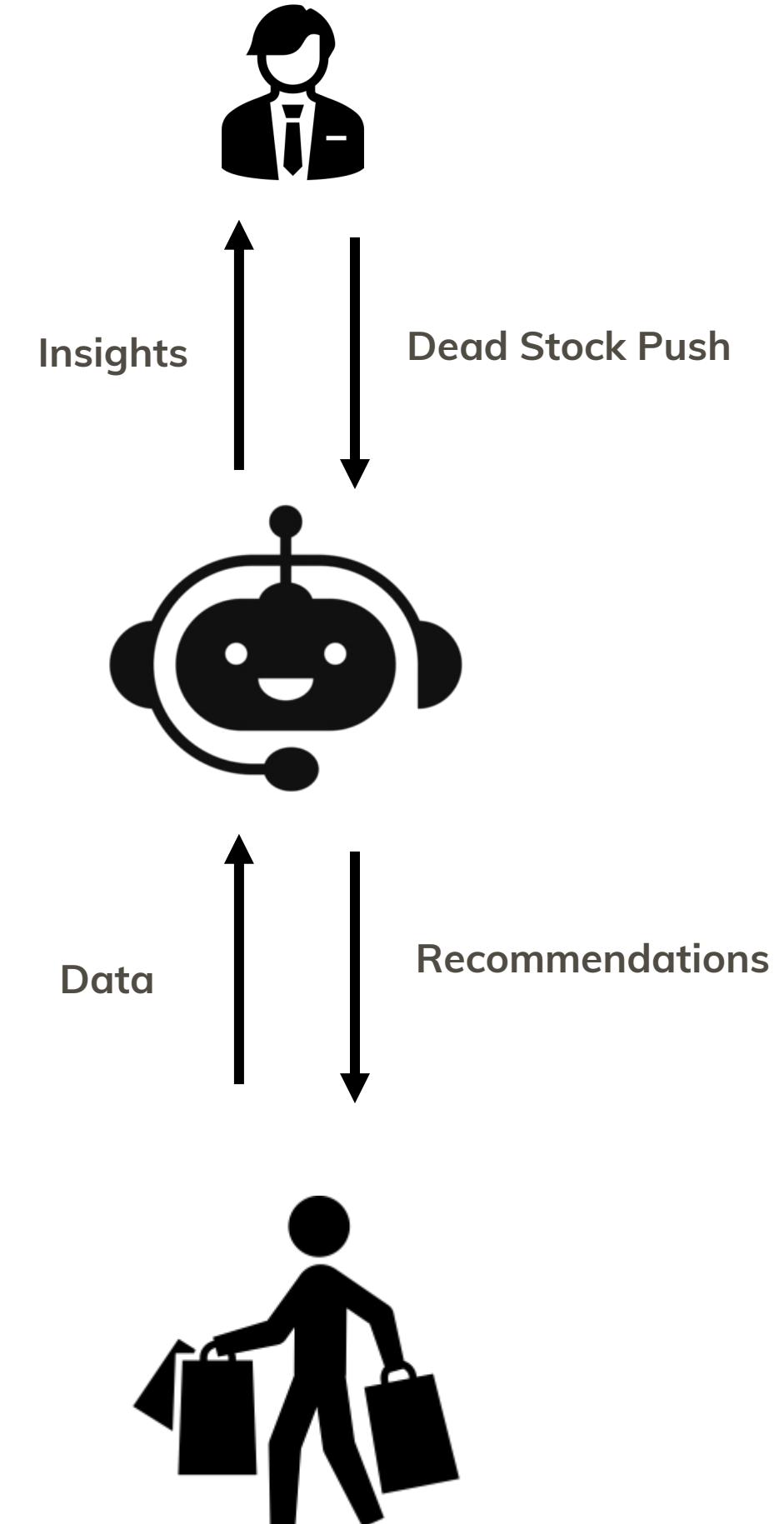
Zara's success stems from its efficient supply chain, delivering stylish garments at competitive prices through pioneering the fast fashion model.

A simple service chatbot only helps current maintenance but is unable to help innovate advance strategy as its not fully bilateral.

Our chatbot has been reimagined to create a common link between the employer as well as the customer.

Thus, it can analyze as well as generate data to help the following –

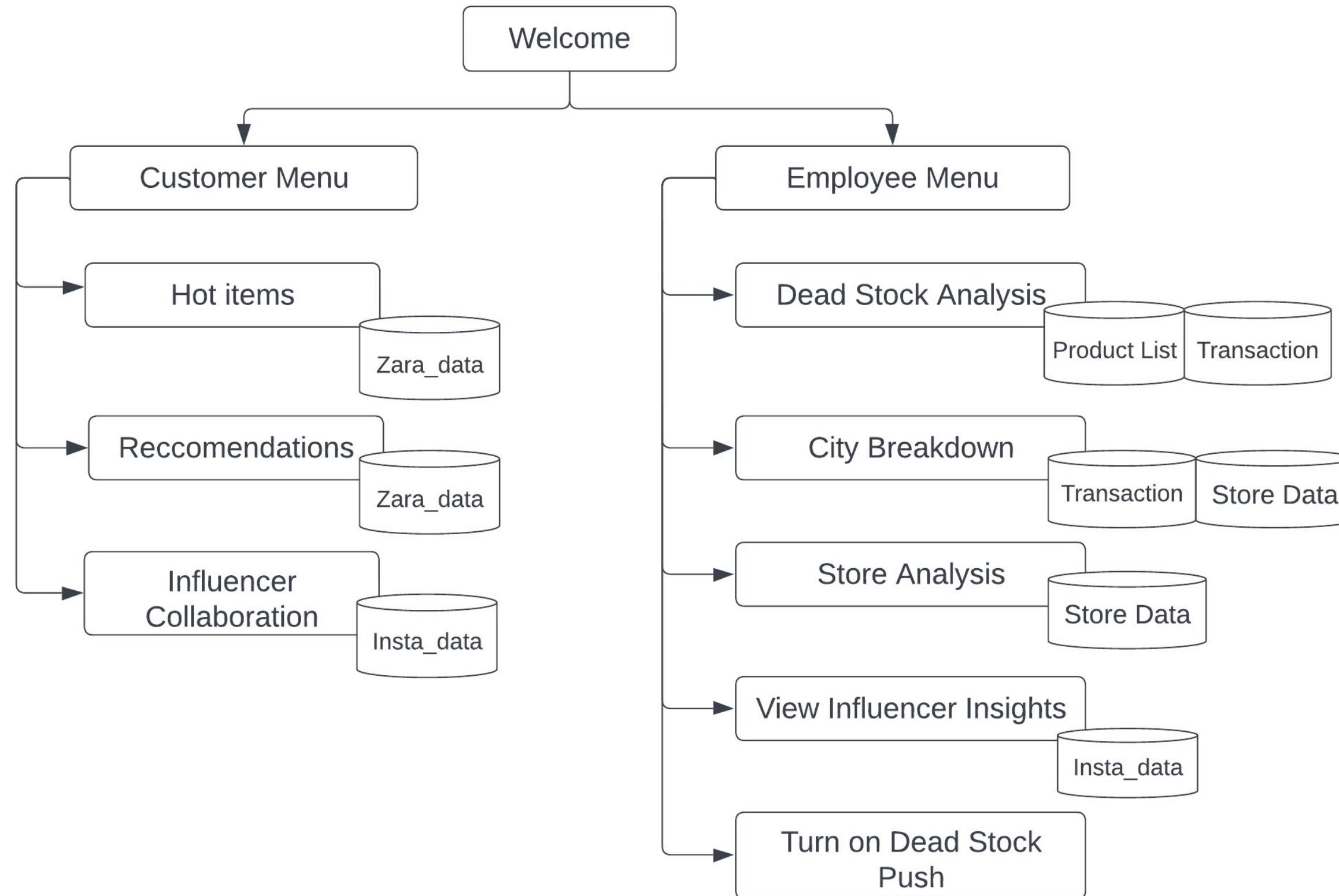
- Tailored Fashion recommendations (better conversion rate)
- Cross-sales and upselling through event based recommendations and complementary item suggestions
- Improve dead stock movement
- Influencer Collaboration and sentiment validation



LIBRARY DICTIONARY

LIBRARY	PURPOSE	INSTALLATION COMMAND
xlrd	Excel file reading	!pip install xlrd
openpyxl	Excel file manipulation	!pip install openpyxl
pandas	Data manipulation and analysis	!pip install pandas
plotly	Interactive data visualization	!pip install plotly
wget	File downloading	!pip install wget
requests	HTTP requests	import requests
BeautifulSoup	HTML parsing	from bs4 import BeautifulSoup
matplotlib.pyplot	Data visualization	import matplotlib.pyplot as plt
matplotlib.ticker	Customizing tick formats on plots	import matplotlib.ticker as mtick
seaborn	Enhanced data visualization	import seaborn as sns
PIL (Image module)	Image manipulation	from PIL import Image
io.BytesIO	In-memory binary I/O	from io import BytesIO
nltk	Natural language processing	import nltk
nltk.tokenize.word_tokenize	Tokenizing words	from nltk.tokenize import word_tokenize
nltk.corpus.stopwords	Stopwords for text processing	from nltk.corpus import stopwords
IPython.display	Rich content display in IPython	from IPython.display import display
fuzzywuzzy	String matching and similarity	from fuzzywuzzy import fuzz, process
tabulate	Tabular data formatting and display	from tabulate import tabulate
plotly.graph_objects	Low-level interface for creating plots	import plotly.graph_objects as go

Overall Architecture



DATASETS

- Transactional dataset: **201000 x 21** data entries, Source [3], Anonymized dataset from previous job converted to Zara dataset

Insaction	StoreID	StoreName	Phone	Address	City	State	Postalcode	Country	ProductID	Product	Product_Price	Profits
1	3	ZARA EDMONTON - EDMONTON SOUTHGATE	+1 7807010339	Cc Southgate	Edmonton	AB	T6J 2P1	CANADA	2	A2	118	16.3
2	18	ZARA VANCOUVER - METROPOLIS AT METROTOWN	+1 6044846095	4700, Kingsway	Vancouver	BC	V5H 4M1	CANADA	37	C37	190	26.2
3	13	ZARA TORONTO - 50, BLOOR STREET	+1 4169162401	50, Bloor Street	Toronto	ON	M4W 1A1	CANADA	47	E47	175	24.1
4	6	ZARA LAVAL - CARREFOUR LAVAL	+1 4509020190	3003, Boulevard Le Carrefour	Laval	QC	H7T 1C8	CANADA	18	B18	133	18.3

- Store Dataset: **19 x 10** data entries, Source [2], Scope is Canadian Zara stores as of 2019

StoreID	StoreName	Phone	Address	City	State	Postalcode	Country
1	ZARA CALGARY - CHINOOK CENTRE	+1 4035382357	6455, Macleod Trail Sw	Calgary	AB	T2H 0K3	CANADA
2	ZARA EDMONTON - 8882-170TH ST. LOCAL 2828	+1 7804424036	8882-170th St. Local 2828	Edmonton	AB	T5T 4J2	CANADA
3	ZARA EDMONTON - EDMONTON SOUTHGATE	+1 7807010339	Cc Southgate	Edmonton	AB	T6J 2P1	CANADA
4	ZARA OTTAWA - RIDEAU-LOCAL 303	+1 6136882741	50, Rideau	Ottawa	ON	K1N 9J7	CANADA

- Product List dataset: **60 x 11** data entries, Source[1], Images directly from Zara website

ProductID	productType	productName	CostPrice	SellingPrice	profitperunit	Production	Sold	DeadStock Ratio	Profit	Zaraimg
1	A	A1	94.83	110	15.17	4500	3847	15%	\$ 58,368	https://static.zara.net/photos///2023/l/0/1/p/5320/705/922/2/w
2	A	A2	101.72	118	16.28	4500	3793	16%	\$ 61,734	https://static.zara.net/photos///2023/l/0/1/p/8073/045/802/2/w
3	A	A3	113.79	132	18.21	4500	3878	14%	\$ 70,606	https://static.zara.net/photos///2023/l/0/1/p/2142/157/022/2/w
4	A	A4	106.90	124	17.10	4500	3933	13%	\$ 67,268	https://static.zara.net/photos///2023/l/0/1/p/2142/150/020/2/w

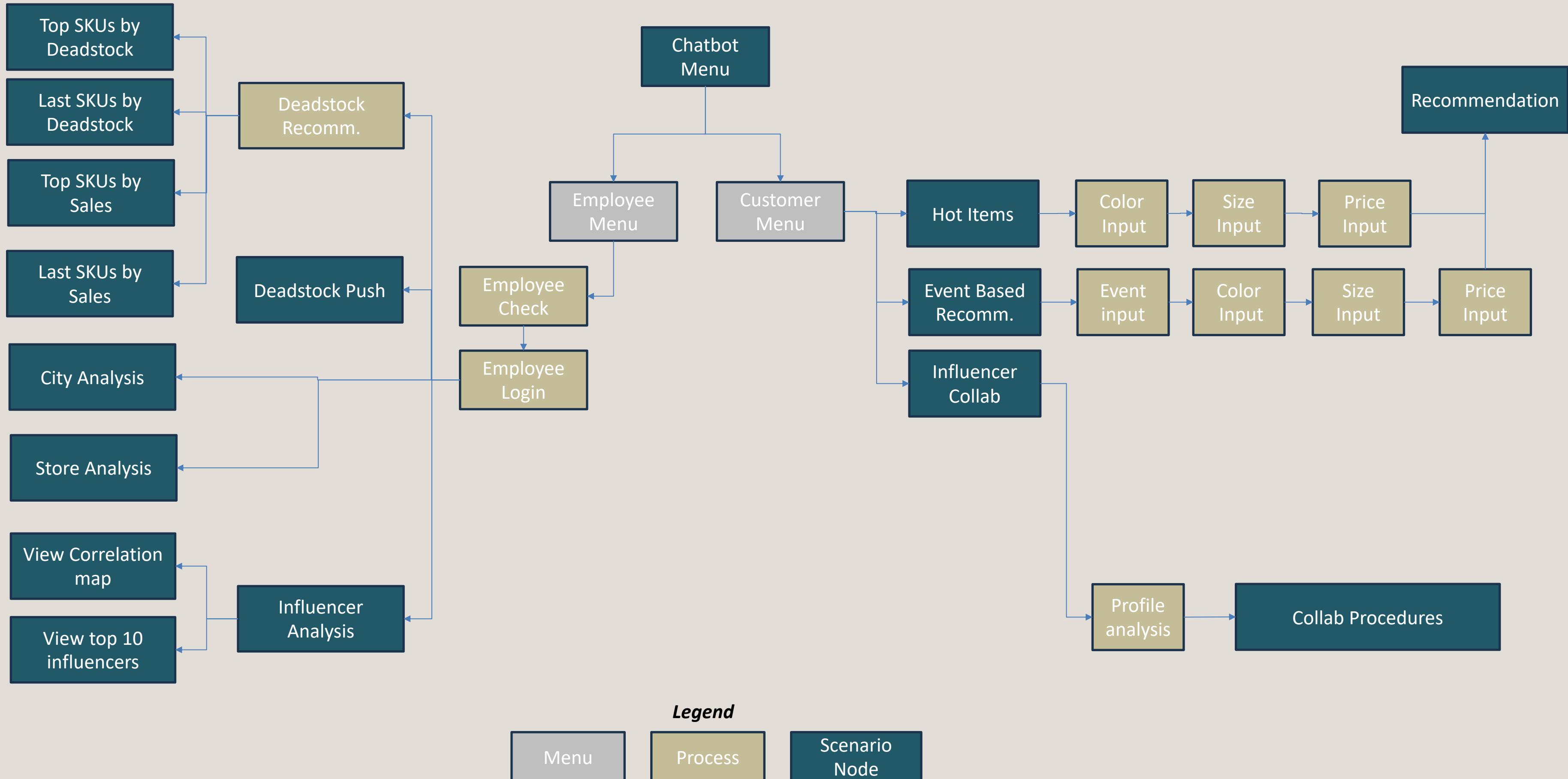
- Influencer Dataset: **40 x 11** data entries, Source[4]

rank	channel_info	influence_score	posts	followers	avg_likes	60_day_eng_rate	new_post_avg_like	total_likes	country	Sentiment score
1	cristiano	92	3.3	475.8	8.7m	1.39%	6.5m	29.0b	Spain	0.46
2	kyliejenner	91	6.9	366.2	8.3m	1.62%	5.9m	57.4b	United States	0.21
4	selenagomez	93	1.8	342.7	6.2m	0.97%	3.3m	11.5b	United States	0.34
5	therock	91	6.8	334.1	1.9m	0.20%	665.3k	12.5b	United States	0.78

- Recommendation Dataset: **1112 x 14** data entries, Source[4]

name	object	description	object	price	int64	availability	object	color	object	size	object	event_category	category	object	url	object	price_category	o...	complimentary...	deadstock	object	empty	popularity_score	i...	trendiness_score	i...
0	LONG PRINT DRE...	Long dress with r...		49	empty	RED	L	Casual and Every...	DRESS														72		52	
1	PLAID SHIRT DRE...	Shirtdress with la...		27	empty	YELLOW	L	Casual and Every...	DRESS														43		94	
2	CORDUROY CAP	Cap with visor. B...		25	InStock	YELLOW	S	Beach and Vacati...	CAP														45		87	
3	CROPPED T-SHIRT	Sleeveless crop t...		7	empty	BLUE	S	Evening and Part...	T-SHIRT														45		91	
4	GEOMETRIC PRI...	Relaxed fit overs...		69	InStock	RED	M	Sleep and Loung...	OVERSHIRT														59		71	

SCENARIO BRANCHES



SCENARIO NODE:
SAVING LEVER RECOMMENDATION

Enter your employee code: EMP8

Enter your password: PASSWORD

Authentication successful. You are logged in as EMP8

What are you interested in?

Can you give me some recommendations on what to do with the best performing stores and worst performing stores?

Total Number of stores: 18

Store with highest sale is store number 4 i.e., ZARA OTTAWA - RIDEAU-LOCAL 303

Recommendation:

1. Maximize Top Sellers: Ensure high-demand products are well-stocked.
2. Streamline Checkout: Expedite checkout process for seamless shopping.
3. Community Events: Host events to engage and strengthen customer relationships.

Store with lowest sale is store number 9 i.e., ZARA QUEBEC - FAIRVIEW POINTE CLAIRE

Recommendation:

1. Trim Excess Stock: Reduce overstocked items.
2. Promote Slow Sellers: Offer discounts on stagnant products.
3. Forecast Demand Accurately: Improve inventory prediction.

	StoreName	StoreID	TotalSales	TotalProfits	UnitsSold
7	ZARA OTTAWA - RIDEAU-LOCAL 303	4	1692521	233451.172413793	11286
2	ZARA EDMONTON - 8882-170TH ST. LOCAL 2828	2	1682353	232048.68965517232	11225
15	ZARA TORONTO - YORKDALE	16	1670620	221672.06551724127	11159

Bot gives the sales manager



Insights

from transactional data

Recommends



Next Steps

to the sales manager

SCENARIO NODE:
DEADSTOCK PREDICTION BY 'SKU'

Do you want to continue (yes/no)? yes

What would you like to know?

1. Top products with highest deadstock
2. Products with lowest deadstock
3. Products with highest sales
4. Products with lowest sales
0. Exit

Please enter your choice: 1

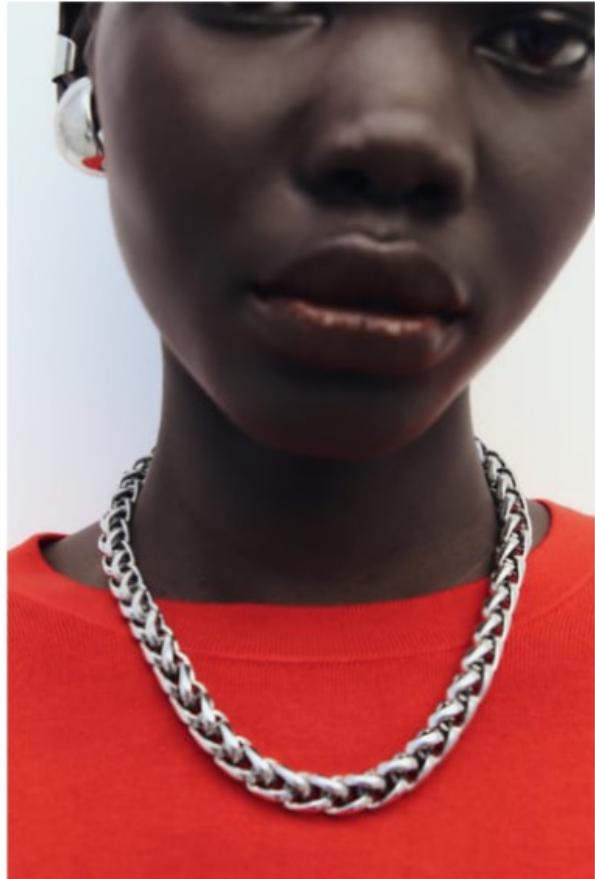
A2
Price: \$118
Sold: 3793/4500



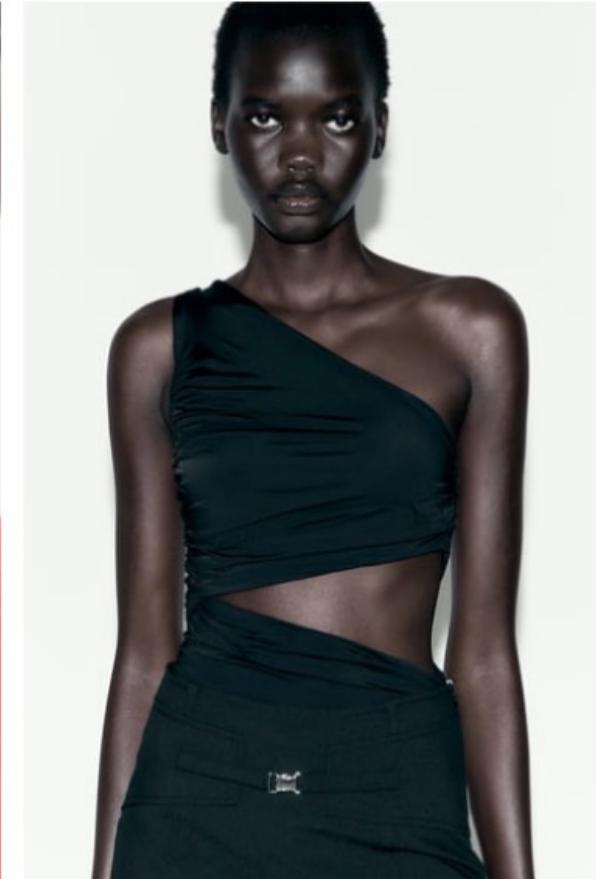
C31
Price: \$147
Sold: 3810/4500



B12
Price: \$128
Sold: 3833/4500



B15
Price: \$155
Sold: 3836/4500



A1
Price: \$110
Sold: 3847/4500



Identify SKUs
not doing well
in the national
supply chain

\$\$+

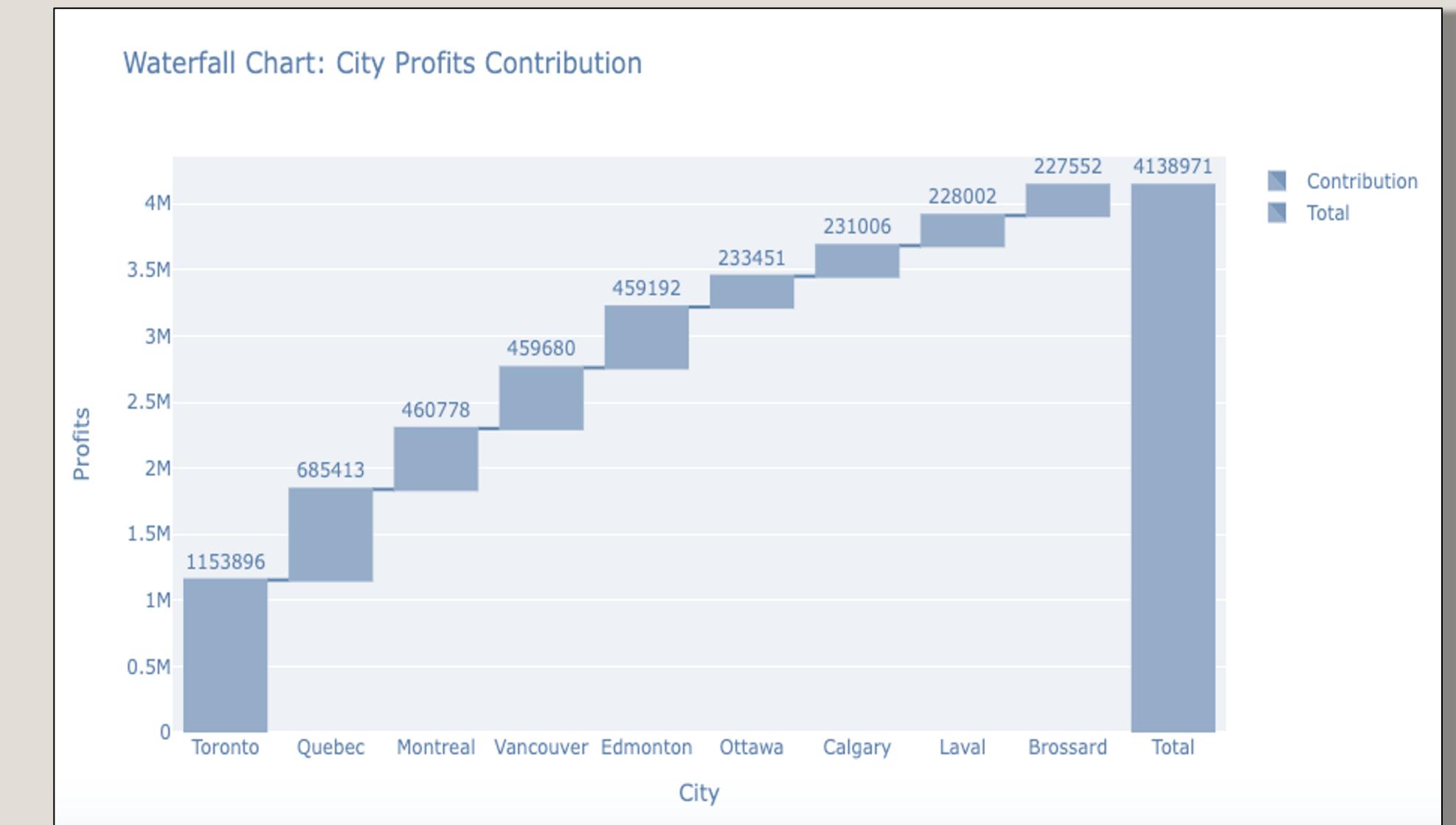
And products
that are doing
well

SCENARIO NODE: SKU 'HOT LIST' ACTIVATION



- 01 'Dumpstock Push' Feature lets the sales managers push products to 'hot items' or 'discount items' to mitigate the bullwhip effect, wherein the items list can be retrieved from the sku analysis function

- 02 Breakdown by geography to isolate problem geographically if there is any correlation with geography. E.g. Montreal being more fashion leaning, is more likely to reject SKUs out of trend



SCENARIO NODE:
ITEM RECOMMENDATION - CUSTOMER

1: Event Based



- The bot provides guides users to find the perfect **outfit for a specific event based** on their preferences
- It asks for the type of events and user preferences such as color, size, and price
- It filters the data and find one item to recommend. Additionally, it finds items that complement the recommended item, utilizing the user preference it obtained

2: HOT ITEM



- The bot provides recommendations for trendy clothing items based on user preferences
- It prompts the user for their preferred color, size, and price range for clothing items
- It sorts the filtered **items by popularity and trendiness scores** in descending order.
- Recommends **the top-rated item** to the user, considering popularity and trendiness scores.

SCENARIO NODE: EVENT BASED RECOMMENDATION - CUSTOMER

Preparing for a Casual Outing

Bot: "Hello! What's the occasion you're dressing up for?"

User Input: "Just a casual hangout with friends."



+ identify the event

Filter Items:

Select items that match with user preferences. If the "deadstock switch" is on, filters out other items here



+ recommending item

Find Complementary Items:

It searches for items with the same event category, matching color, and size as the recommended item



+ complimentary item

Output:

"Great! It looks like you're attending a 'Casual and Everyday Wear' event."



+ get user preferences

User Input:

Preferred color: "Blue"

Preferred size: "Medium"

Preferred price range: "Medium"

Here is our recommendation:

Recommendation:

Name: Casual Denim Jacket

Size: Medium

Color: Blue

Price: \$35

URL: [Link to Item]

You might also be interested in this:

Complementary Item:

Name: Graphic Print T-Shirt

Size: Medium

Color: Blue

Price: \$25

URL: [Link to Item]

SCENARIO NODE:
HOT ITEM RECOMMENDATION - CUSTOMER

Scenario: Exploring Trendy Clothing Recommendations

User: "I'm looking for some trendy clothing options. Can you help?"



+ get user preferences

Output:

Let's get started! Please provide your preferences:"

User Prompt:

<shows available colors> What's your preferred color?
<shows available sizes> What's your preferred size?
<shows available price range > What's your preferred price range?"



+ Filter Items

Select items that match with user preferences. If the "deadstock switch" is on, filters out other items here

Output:

Thank you for providing your preference!
Let's find you some trendy items that match preferences



+ Identify trend item

Sort the filtered items by popularity and trendiness scores

Check if there are matching items that meet the user's preferences.



+ recommending item

Output:

I recommend 'Stylish Denim Jacket' by Zara!
Description: Stay trendy with this stylish denim jacket featuring a modern design
Price: \$75
Category: Outerwear
You can check it out [here](#).

SCENARIO NODE:
INFLUENCER COLLABORATION - CUSTOMER

- One of the features of the chatbot allows the customer to apply for collaborations to promote the brand.
- The bot looks up the Instagram name and checks if they are above a certain score threshold. Then it figures out the country and weather to match the zara collection – **summer ,fall, winter or spring.**
- The bot then gives them a suggestion to post and makes sure they tag @ZaraFashionBot – which then allows the bot to gather sentiment data from their posts' comments.



 thefinelinemag • Follow

Thefinelinemag Excited to reveal the magic of Zara's Fall Collection! From cozy knits to timeless outerwear, this collaboration has my heart ❤️✨

@ZaraFashionBot
#FallFashionFaves

confessionsofasuperager @nattyz_thethird piece thanks girl!!! Love your style too!
confessionsofasuperager @amylhendy awww...thank you and so are you my friend!
confessionsofasuperager @rachelmaria_le thanks so much babe!!!
amylhendy You have SUCH amazing style!!!

illuminatedme @confessionsofasuperager LOVE how these stripes flow. What a

1,048 likes
22 HOURS AGO

Add a comment... 

INFLUENCER COLLABORATION - CUSTOMER

ZARA

Hi! Welcome to the Zara chatbot. Before we begin, please choose if you are an employee or customer.

1. Employee
2. Customer
3. Exit

Welcome, Customer! What would you like help with today?

1. Hot items
2. Event Based Recommendations
3. Influencer Collaboration
4. Exit

Influencer Collaboration:

Hi cristiano, lets see if we have some options based on your profile.

Congrats I see you qualify for our collaboration program. I see the season in Spain is currently summer

Here is what you can do!:

Share your creation on Instagram with the hashtag #SummerVibesChallenge
and tag @ZaraFashionBot.

Don't forget to mention why your outfit represents the perfect summer vibe.

SCENARIO NODE: INFLUENCER INSIGHTS (EMPLOYEE)

- Moving on to the other side, this data can then be used by employees to assess market penetration through influencer performance.
- They can look at the Top 10 influencers that give Zara the best sentiment.
- They can also look at a heatmap of how their Brand sentiment is correlated to multiple social media factors such as influence score, number of posts, followers etc.

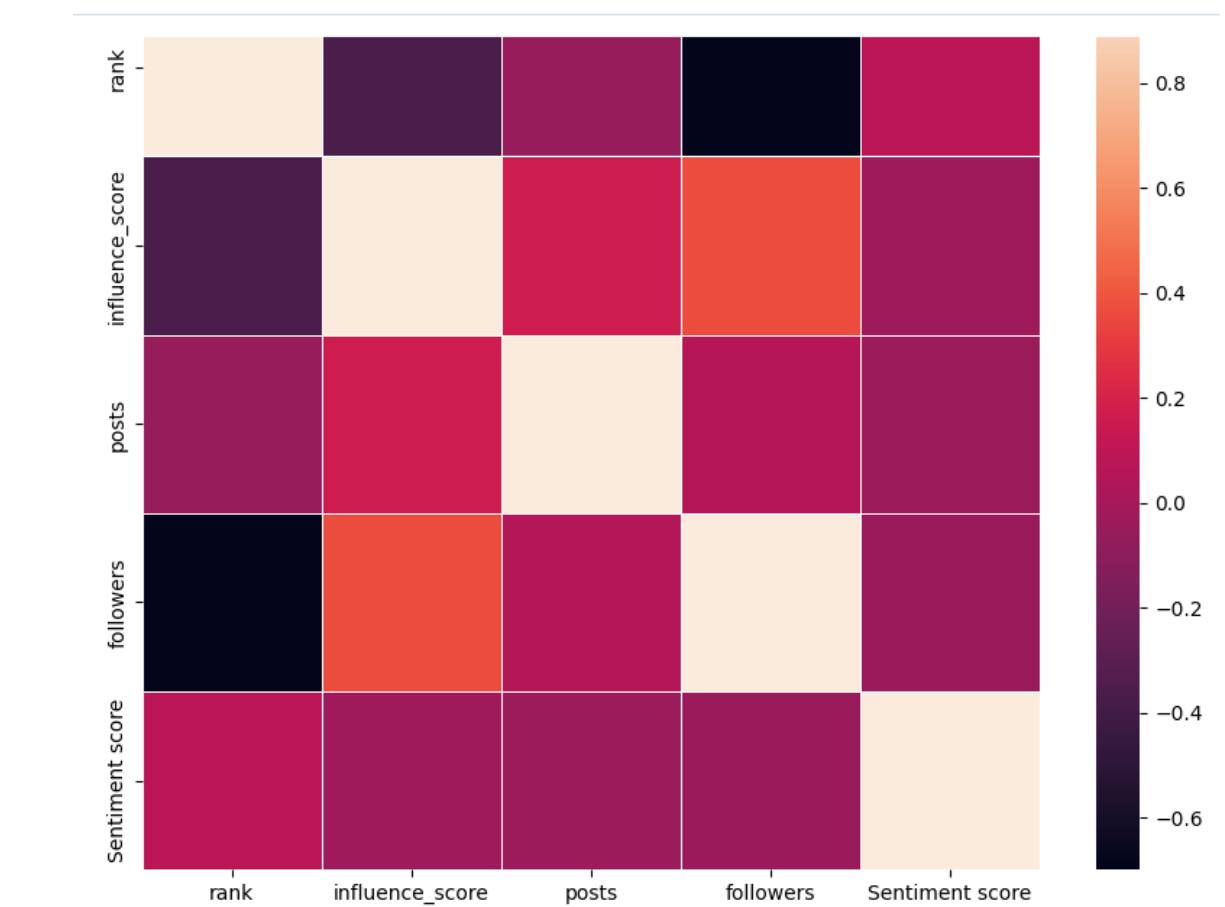
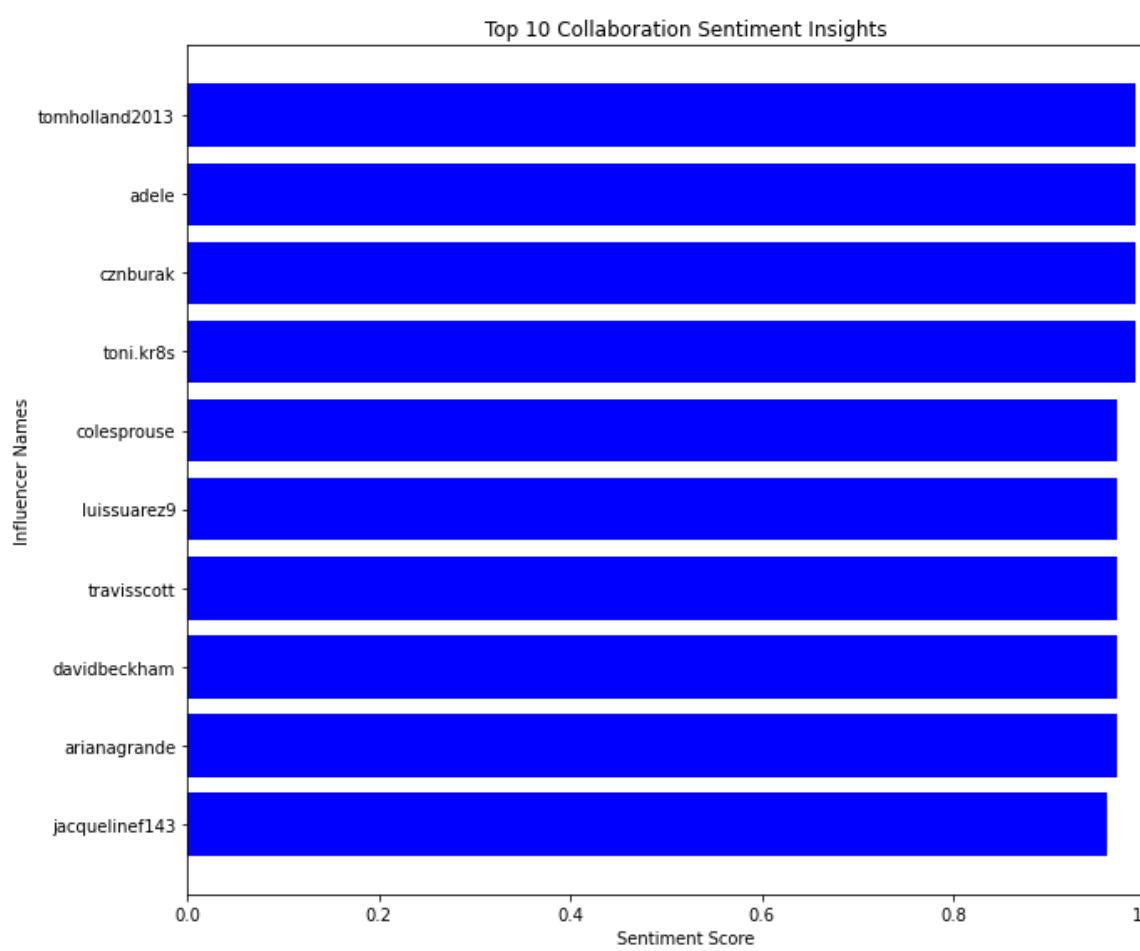
ZARA

ZARA: Select a category:

1. Deadstock Analysis
2. City Breakdown
3. Store Analysis
4. View Influencer Insights
5. Turn on Dead Stock Push
0. Exit

Welcome, what would you like to view?

1. View Top 10 Influencer by Brand Sentiment
2. View Correlation HeatMap
3. Exit



Future Suggestions

- **Segmentation Training** - Chatbot can be trained based on region and customer segmentation using a neural network approach. This will tailor interactions better and provide faster and more effective conversion rates.
- **LLM Wrapper** – The chatbot can be wrapped in a Large language model like Llama 2 or ChatGPT. This will provide much better user interaction as well as contextual understanding.
- **Image Recognition** – Users can be given an option to upload images of clothes they like and the chatbot can find similar products based on it.
- **Augmented Reality** – That chatbot can be further developed to provide a virtual wardrobe. The user can then try out different outfits using augmented reality.





LIVE CODE DEMO
[\(LINK\)](#)