

Predicting Consumer Tastes with Big Data at Gap

Web Data Analytics Group Project

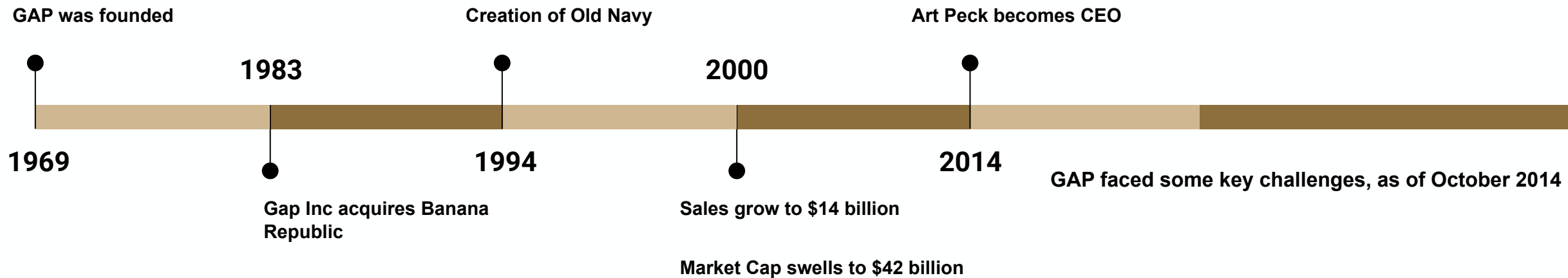
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**Abhishek Bagepalli
Ananth Mohan
Tushar Malankar**



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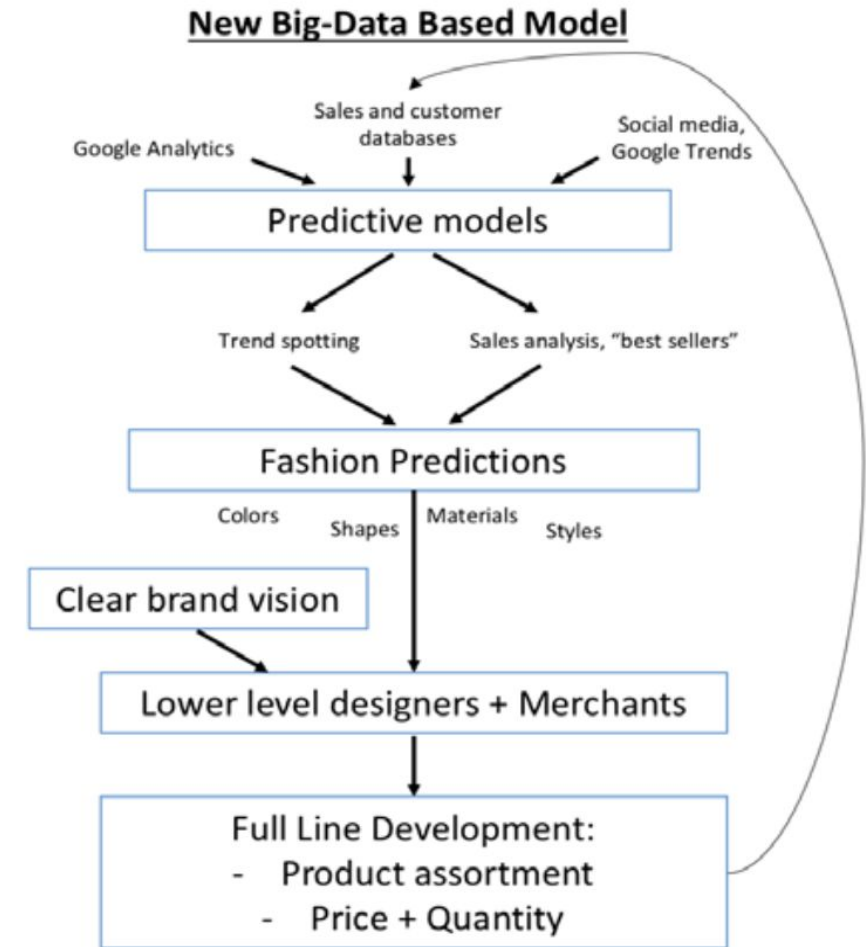
Gap - founded in 1969, evolved over time



Peck envisioned 'Product 3.0' using Big Data

2015

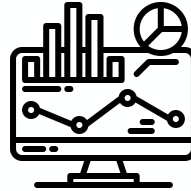
Art Peck fires creative directors and moves to a completely data driven approach



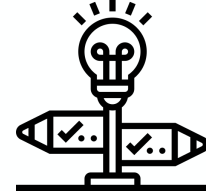
We aim to address the following...



Was replacing
creative directors
beneficial for GAP?



How to design a
data-driven
analytical approach
for creative design in
the modern age?



How GAP can
balance Science and
Art in Marketing?

Our Approach



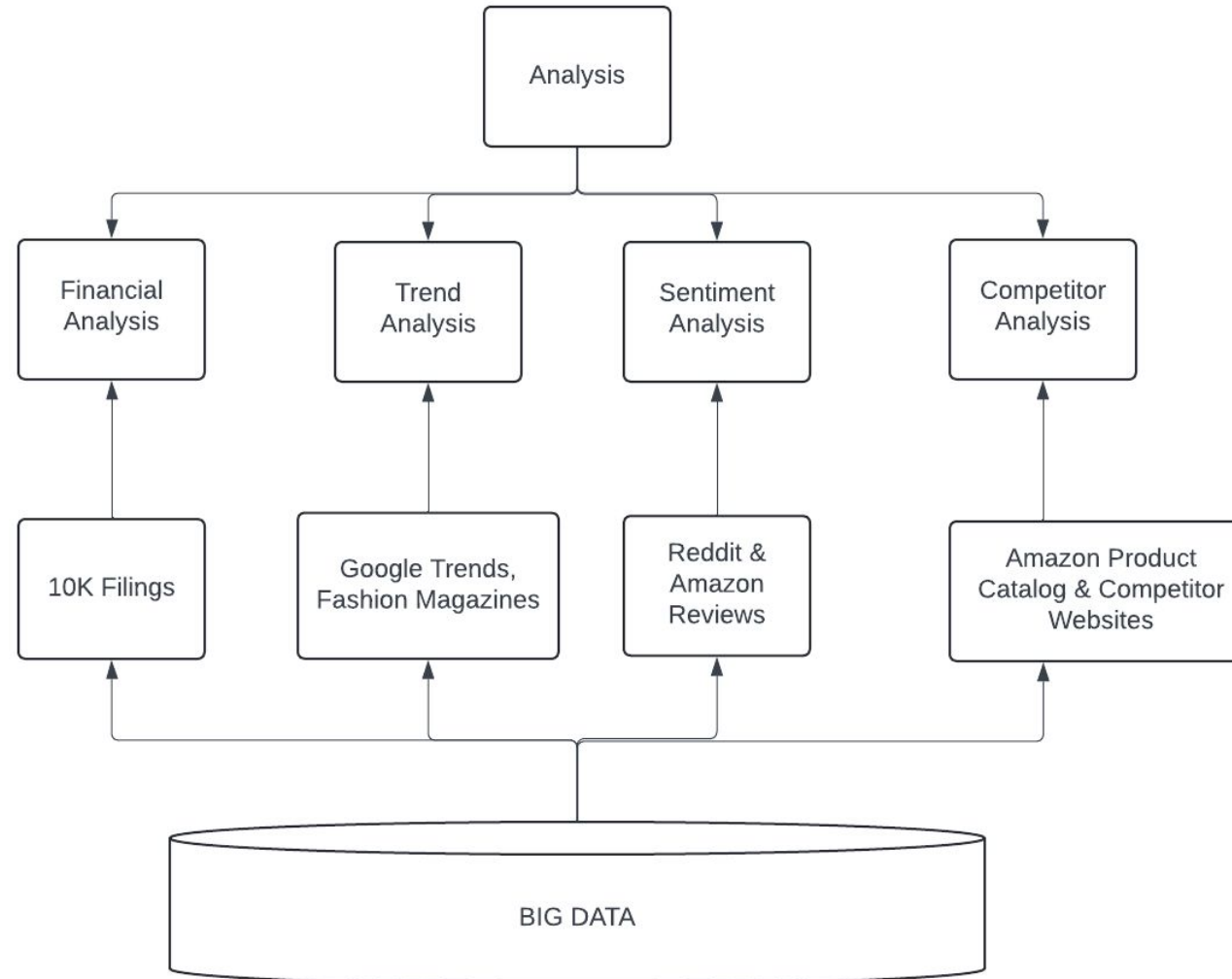
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There are several approaches we can take with Big Data, we limited the presentation to a few of them

Challenge —→ Web Data helps to understand —→ Implementation

1	Changing Consumer Preferences <i>Sustainability, Personalization</i>	What are people looking for?	<ul style="list-style-type: none">• Browser Search Trends• Keyword search
2	Competition & Discounting <i>Overcrowded Segment, E-Commerce, Fast Fashion</i>	What is the competition doing?	<ul style="list-style-type: none">• Competitor Product Portfolio• Amazon Product Listing & Discounting Comparison
3	GAP's Loss of Uniqueness <i>More Classic than Trendy</i>	What do customers think about GAP?	<ul style="list-style-type: none">• Reddit Sentiments• Amazon Review Sentiments

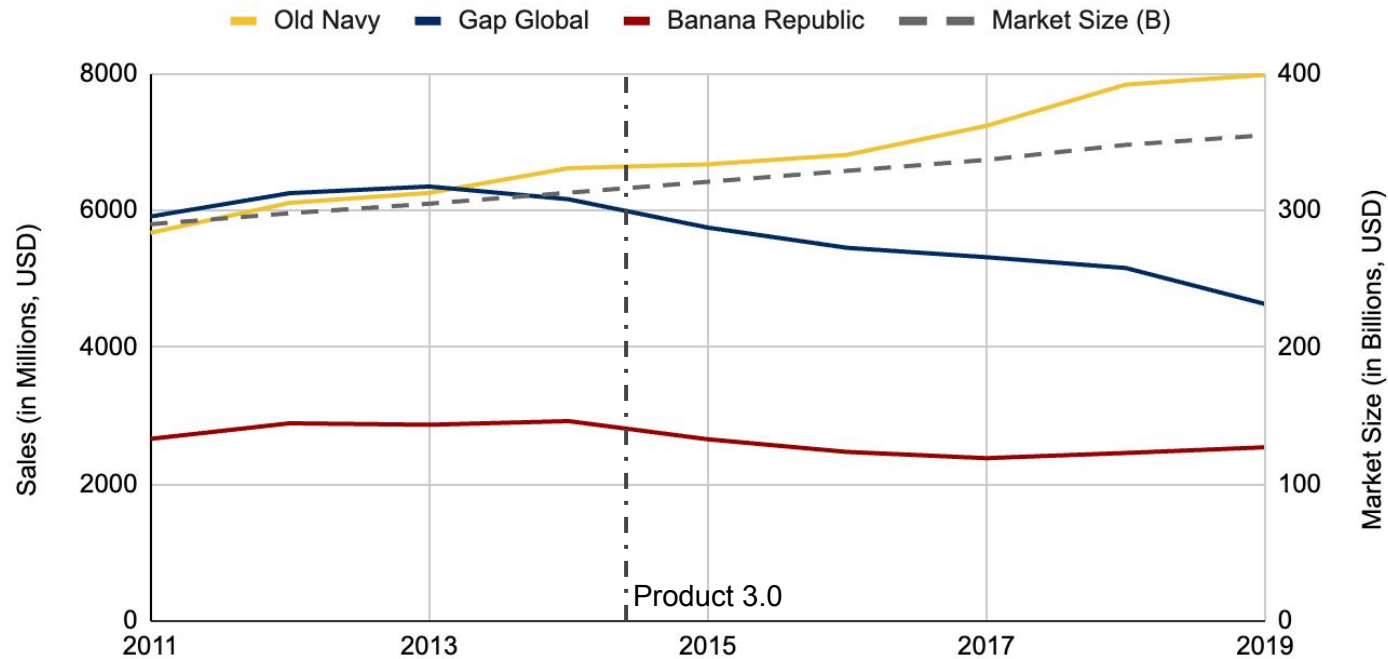
We used the following analyses...



Financial Analysis - 10K Filings

Was Peck correct in firing his creative directors and replacing them with a big data- driven creative process? Why or why not?

Sales, by Brand (in Million USD) and Market Size (in Billion USD)



Apparel Market Size grew at an average of +2.5% from 2011 to 2019*

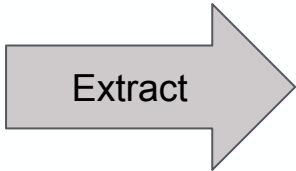
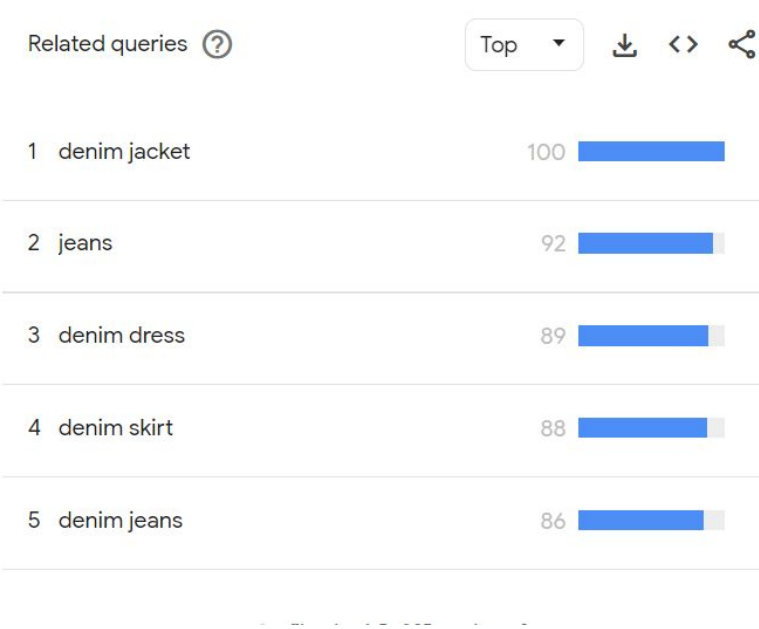
Old Navy grew at a rate more than market size growth

GAP and Banana Republic stayed flat or went down

Big Data driven approach didn't help to change the course for Gap and Banana Republic, but Old Navy grew. Economical fashion brands like Old Navy might benefit more from real-time data, while Banana Republic, a premium brand, may still need a touch of traditional creative influence

* Source - [Global Data - Market Size of Retail Clothing in US](#)

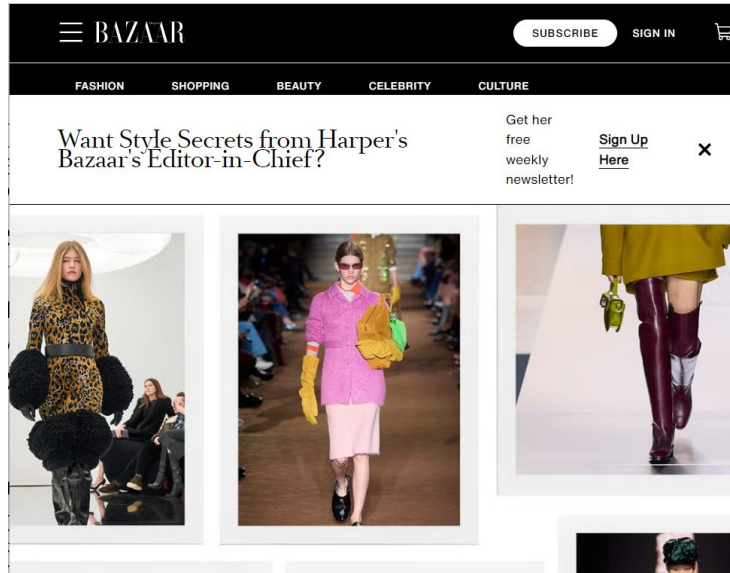
Optimize Product Lineup Based on Consumer Preferences



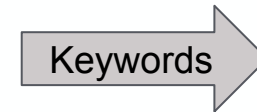
TOP	SEARCH VALUE
denim jacket	100
denim dress	93
jeans	91
denim skirt	88
denim jeans	88
denim shorts	73
denim tears	70
shorts	69
denim shirt	58

Data Available	Analytical Solution	Business Impact
Fetching trend search values from google trend using python's pytrend library	Using high-volume search keywords as indicators of potential fashion trends.	Companies can shape their product lineups based on search trends, as these trends reveal consumer interest. For example, the data indicates that denim jackets are a trending topic within the denim category, suggesting a strong demand for this product. Google Trends also provides search values on a regional level.

Trend Analysis - Identify Emerging Fashion Trends



TREND ITEMS
 The Relaxed Suit
 The Leopard Print Clutch
 The Leather Trench
 The Cashmere Crewneck
 The Track Pant
 The Mesh Moment
 The Boot-Pant Hybrid
 Silk and Lace
 The Draped Top
 The Burgundy Skirt
 The Suede Jacket
 The Corduroy Vest
 Colorful Layers
 Circle Skirts
 Leopard! Leopard! And More Leopard!



Top Trending Keywords:
 leopard: 2 occurrences
 leather: 2 occurrences
 relaxed: 1 occurrences
 suit: 1 occurrences
 print: 1 occurrences
 clutch: 1 occurrences
 trench: 1 occurrences
 cashmere: 1 occurrences
 crewneck: 1 occurrences
 track: 1 occurrences

Data Available	Analytical Solution	Business Impact
Scrape using Selenium , BeautifulSoup for scraping the fashion suggestion make by fashion blogging websites like Vogue , Elle and Harpers Bazaar	Predicting possible Emerging Trend Identification through Scraping	By scraping fashion magazines and blogs, brands can identify emerging trends and important keywords. This data-driven approach allows manufacturers to understand current consumer interests more accurately than intuition alone. Eg. Gap can release more leopard based clothing in their next lineup

Sentiment Analysis - Reddit



Old Navy	Banana Republic	Gap
'mixed': 46	'mixed': 2	'mixed': 24
'neutral': 10	'neutral': 14	'neutral': 15
'positive': 37	'positive': 15	'positive': 9
'negative': 17	'negative': 12	'negative': 23

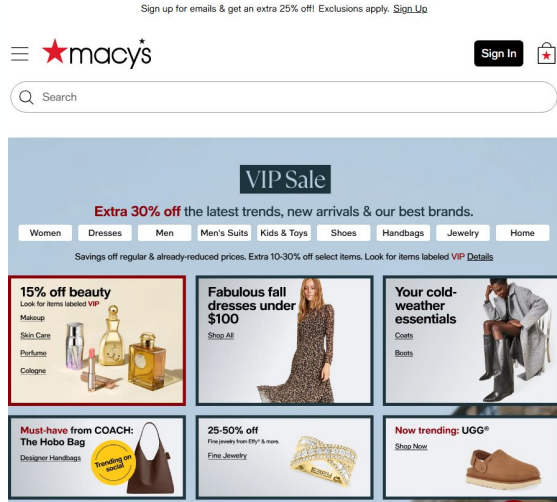
Data Available

Analytical Solution

Business Impact

Scrape for comments on popular posts from each subreddit about all three brands of Gap Inc	Sentiment Analysis	Aids the brands to better understand consumer sentiments and make informed business decisions.
	Key Insight	From the sample analysis, we see that Gap has the most negative sentiment while Old Navy has a positive sentiment overall. This is reflected in the net sales of each brand as well.

Competitor Analysis - Best Selling Product Listing & Discounting



Brand Name	Product	Regular Price	Offer Price
karl lagerfeld	womens-checkered-one-button-blazer	\$199.00	\$139.30
on 34th	womens-plaid-boyfriend-blazer-created-for-macys	\$99.50	\$69.65
kasper womens	womens-single-button-notched-lapel-blazer	\$119.00	\$83.30
donna karan	womens-collarless-button-sleeve-blazer	\$169.00	\$34.65
style co	womens-polar-fleece-mock-neck-jacket-created-f...	\$49.50	\$105.00
levis womens	womens-ribbed-edge-cropped-denim-bomber-jacket	\$150.00	\$27.65

Data Available

Scrape for product listings for competitor companies of interest and related categories:

- Brand Name
- Product Name
- Regular Price
- Offer Price

Analytical Solution

Competitor Stock Analysis

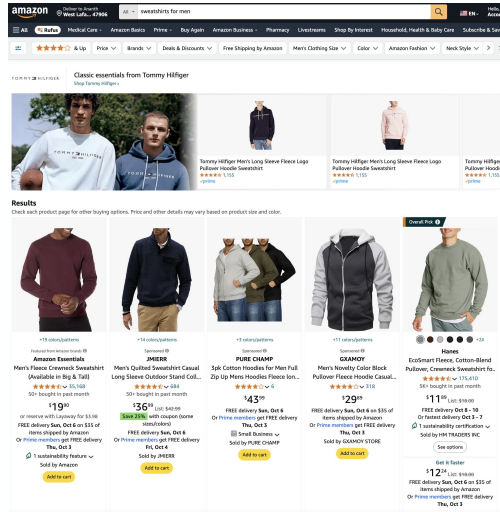
Key Insight

Business Impact

Macy's listings provide an overview of bestselling products. Understanding competitor stock performance helps identify industry trends, market positioning, and potential shifts in consumer preferences.

From the sample, we found that 83% of best sellers were products on which discounts were being offered. Furthermore, **ALL** of these discounted items had a discount of 30%.

Competitor Analysis - Competitor Product Listing & Discounting



amazon_men_sweatshirt

brands	items	avg_ratings	ratings	past_months_sales	prices	markup_prices
JMIERR	Men's Quilted Sweatshirt Casual Long Sleeve	4.5 out of 5 stars	684	50+ bought in past month	\$ 36.99	\$ 42.99
PURE CHAMP	3pk Cotton Hoodies for Men Full Zip Up Me	4.0 out of 5 stars	6		\$ 43.99	
JMIERR	Mens 2024 Casual Cotton Hooded Collar Dr	4.3 out of 5 stars	289	100+ bought in past month	\$ 32.99	
Gesean	Men's Novelty Color Block Pullover Fleece	4.5 out of 5 stars	12,090		\$ 29.99	
Hanes	EcoSmart Fleece, Cotton-Blend Pullover, Cr	4.6 out of 5 stars	1,75,410	5K+ bought in past month	\$ 12.24	\$ 18.00
...

Data Available

Analytical Solution

Business Impact

Scrape using **Selenium**, **BeautifulSoup** for product listings for competitor companies of interest and related categories:

- Item
- Average Rating
- Number of Ratings
- Past Month Sales
- Price & Marked-up Price

Monitor competitor product portfolio

Amazon listings can be used to understand the different type of products (shirts, jeans) for a competitor and also top brands in each category

Sales analytics

Amazon displays range of the number of units sold in the last month. Time series analysis of this data can help to understand consumer different products sold over time and it's seasonal variations

Pricing analytics

Running a regression analysis to understand impact of discount, price on sales

GAP Product Reviews and Sentiment Analysis

Customer reviews
★★★★★ 4.6 out of 5
412 global ratings

5 star 83%
4 star 9%
3 star 3%
2 star 1%
1 star 5%

▼ How customer reviews and ratings work

Review this product
Share your thoughts with other customers
[Write a customer review](#)


Customers say
Customers like the comfort, quality, and fit of the sweatshirt. They mention it's super soft, has a great style, and the black on black is cool.
As generated from the text of customer reviews
[Select to learn more](#)


[Comfort](#) [Quality](#) [Fit](#) [Style](#)

Reviews with images
[See all photos](#)

[Top reviews](#)

Top reviews from the United States

 Michel Sampaio
★★★★★ **Very comfortable**
Reviewed in the United States on September 15, 2024
Size: Small Color: Black / Black Logo [Verified Purchase](#)
Good quality
[Helpful](#) [Report](#)

 Great, very useful
★★★★★ **Comfortable**
Reviewed in the United States on August 30, 2024
Size: Medium Color: Light Grey (Black Logo) [Verified Purchase](#)
Love the color and quality
[Helpful](#) [Report](#)

Extract

Rating	Review_heading	Review_date	Size	Color	Review_text
5.0 out of 5 stars	Quality and Comfort	September 13, 2024	X-Large	Brown (Dark Brown Logo)	Good Quality Comfort Great a warm is Good all the way around.
5.0 out of 5 stars	One word..AMAZING	June 13, 2024	X-Large	Black / Black Logo	This is soft, comfortable, and rugged. The black on black is so cool. Compliments all day long enquiring where did I get it. Everyone tries to borrow it. Will definitely get a second to keep in the car.
...

Data Available

Scrape using **Selenium**, **BeautifulSoup** for reviews of products sold by GAP:

- Rating
- Review Heading
- Review Date
- Size, Color
- Review Text

Analytical Solution

Text analysis

Sentiment analysis

Business Impact

Use LLMs or text analysis to monitor user feedback which could be used for product improvements and design ideas

Use LLMs or NLP to understand user reaction to a product and what drives those

Art vs. Science in Marketing



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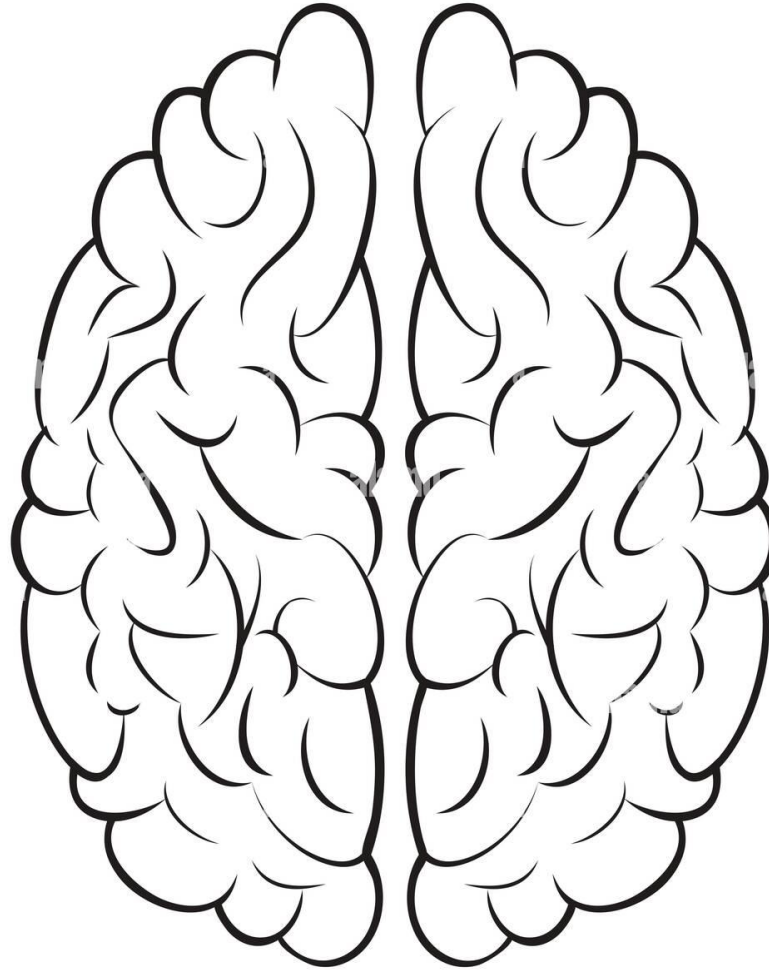
ART

Maintaining Brand Identity

Creating Compelling Ad
Campaigns

Capturing Emotional Interest

Aesthetic Creation



SCIENCE

A/B Testing for Ad impact

Demand Forecasting

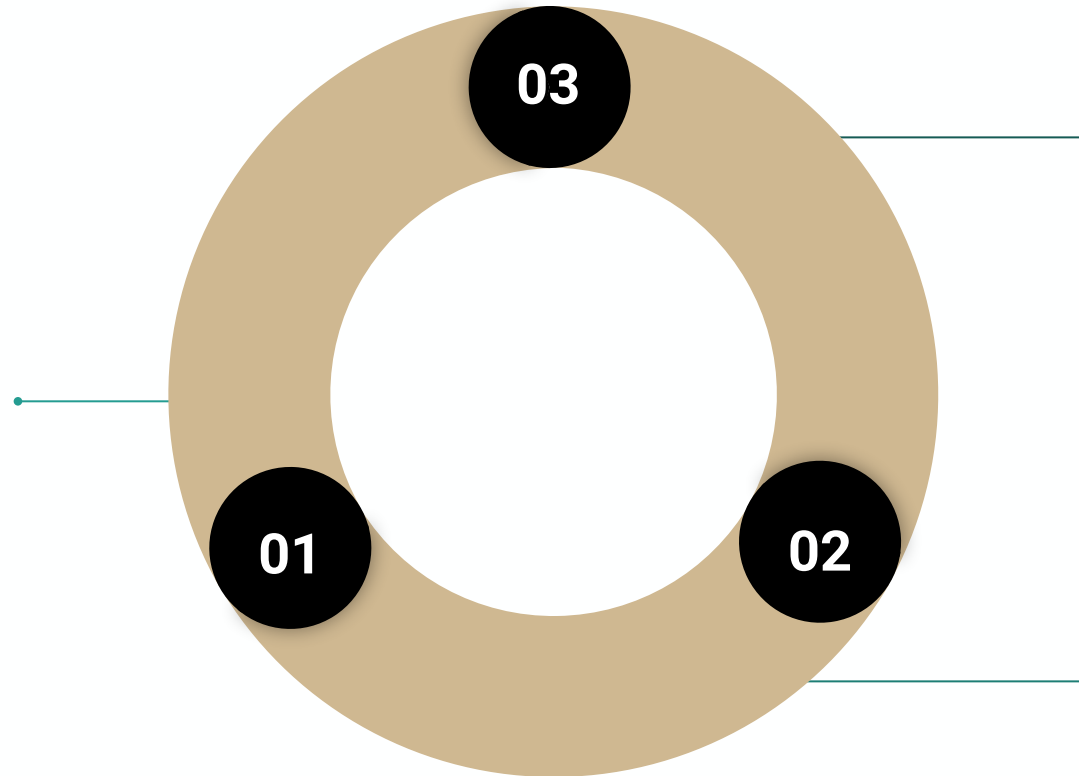
User Segmentation

Data Driven Ad Placement

Combining Art and Science

DESIGN APPROACH

Instead of relying on intuition, A/B testing allows us to compare between Ad strategy approaches and determine which one delivers the best results..



TREND AND IDENTITY

Analyzing clickstream data reveals trending products which must be highlighted in the ads , Ad designers can use their creative to decide the best way to present them to the audience.





ADS

Data analytics can identify potential customers, while creativity comes in how you reach to these customers.

Data informs past and present decisions. Innovation thrives on creativity and action to shape the future

Limitations

Limitations

Trend Analysis		Search does not equal demand Short term fluctuations in searches
	Fashion Magazines 	Editorial bias Delayed reporting Focus on high fashion
Sentiment Analysis		Hive mentality of users tends to sway majority opinion towards one side
		Negative comments feel louder online
Web Scraping	Website network security	
Competitor Analysis	Scraping Competitors website is a superficial knowledge of brand's creative and marketing strategy.	

Does the big data approach work for all three of Gap Inc.'s primary brands: Old Navy, Gap, and Banana Republic?



Fast fashion at an economical rate

- Data guides trend-driven, high-volume product lines, keeping Old Navy relevant to mass-market tastes



Mid-tier apparel brand focusing on classic

- The creative director plays a key role in blending timeless styles with fashion trends, and ensuring brand consistency across both digital and physical platforms.
- Big data primarily drives operational decisions like pricing and stock management.



Premium brand which needs creative touch

- A creative director is vital for Banana Republic's luxury market, as big data can't fully capture the brand image, exclusivity, and aesthetic refinement.
- While creative vision remains irreplaceable, data aids customer insights and marketing

Thank You



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Appendix



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Data Sources

10K Filing for Gap Inc. - [c.gov/Archives/edgar/data/39911/000003991119000023/fy201810-k.htm](https://www.sec.gov/Archives/edgar/data/39911/000003991119000023/fy201810-k.htm)

Reddit Link for Sentiment Analysis - https://www.reddit.com/r/malefashionadvice/comments/dtotnr/the_gap_ceo_is_leaving_the_companys_stock_lost/?sort=top

Link to Macy's - https://www.macys.com/shop/womens-clothing/new-womens-clothing/Product_department,Sortby/Jackets,BEST_SELLERS?id=68514

Amazon link - <https://www.amazon.com/s?k=sweatshirts+for+men>

Harpers Bazaar - <https://www.harpersbazaar.com/fashion/trends/a46826009/fall-2024-trends/>

Vogue Magazine- <https://www.vogue.com/article/fall-shopping-list-editor-picks-2024>

Market size of retail clothing in the US - <https://www.globaldata.com/data-insights/retail-and-wholesale/market-size-of-retail-clothing-in-us/>

Elle Magazine - <https://www.elle.com/fashion/trend-reports/a46805342/fall-2024-fashion-trends/>

Google Trends - <https://trends.google.com/trends/explore?date=today%203-m&geo=US&q=denim&hl=en>

Web Scraping - Macy's

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/shop/product/karl-lagerfeld-paris-womens-checkered-one-button-blazer?ID=18751335  
/shop/product/donna-karan-womens-collarless-button-sleeve-blazer?ID=18799853&swatchColor=Peacock Bl  
/shop/product/kasper-womens-single-button-notched-lapel-blazer?ID=18935114  
/shop/product/style-co-womens-polar-fleece-mock-neck-jacket-created-for-macys?ID=18043259&swatchColor=Deep Black  
/shop/product/levis-womens-ribbed-edge-cropped-denim-bomber-jacket?ID=17962311  
/shop/product/on-34th-womens-plaid-boyfriend-blazer-created-for-macys?ID=18165791&swatchColor=Fuchsia Pur Cmb  
/shop/product/style-co-womens-zip-front-polar-fleece-vest-created-for-macys?ID=18056887&swatchColor=Neo Natural  
/shop/product/dkny-sport-womens-tech-fleece-logo-jacket?ID=18693336&swatchColor=Black  
/shop/product/i.n.c.-international-concepts-womens-hourglass-trucker-jacket-created-for-macys?ID=18131002  
/shop/product/tommy-hilfiger-womens-faux-leather-trim-riding-jacket?ID=18498960  
/shop/product/avec-les-filles-womens-belted-long-sleeve-military-jacket?ID=19001788  
/shop/product/style-co-petite-polar-fleece-zip-front-jacket-created-for-macys?ID=18043253&swatchColor=Jazzy Blue  
/shop/product/karl-lagerfeld-paris-womens-tweed-jacket-regular-petite?ID=18698979  
/shop/product/tommy-hilfiger-womens-faux-suede-trench-coat?ID=18498962  
/shop/product/tommy-hilfiger-womens-faux-suede-band-jacket?ID=18498963&swatchColor=Paprika  
/shop/product/lauren-ralph-lauren-womens-twill-blazer?ID=18800742  
/shop/product/style-co-womens-embroidered-sleeve-field-jacket-created-for-macys?ID=18209071  
/shop/product/avec-les-filles-womens-equestrian-detail-faux-leather-jacket?ID=19001790
```


Web Scraping - Reddit

I've worked at Old Navy for five years and I know around three years ago the parent company GAP was caught using practically slave labor in some of the sweatshops where the clothes were made.

Yeah I've noticed this too. It sucks because ON and Gap used to be a good source for affordable tops made in natural fabrics (surprisingly hard to find in Canada). Nowadays everything is synthetic.

[deleted]

I had bought a pair of skinny jeans at GAP that I really liked and decided to go ahead and buy a couple more pairs in the exact same size and style the next time I went, but when I got to the store they were out of stock.

Gap has been circling the drain for years. Most of the old box stores are because of how cost effective it is to just host an online shop. As quality degrades so do sales since people don't want to pay for quality anymore.

I pretty much solely buy workout clothes and underwear from GAP these days. I go into the store *hoping* something will call to me... but then I just go to the back to the GapFit and buy whatever.

I think a couple things happened (I worked at Gap in the late 90s and early 2000s FYI)
After the recession, stores got scared to take chances. The adorable enamel pins, skinny sequin scarves, bright corduroy peacoats and print tops with beaded details? OUT. Basic stuff like white t-shirts and jeans? IN.
The death spiral started. Not enough sales means hours cut and fewer people on the floor. Fewer people means disorganized and chaotic sales rooms/rounders and longer lines, and stores

Web Scraping - 10K Filings

```
[[['Operating Results ($ in millions)', '2018(52)', '2017(53)', '2016(52)', '2015(52)', '2014(52)'], ['Net sales', '$16,580', '$15,855', '$15,855', '$15,855', '$15,855'], ['Per Share Data (number of shares in millions)']  
[[['Per Share Data (number of shares in millions)', '2018(52)', '2017(53)', '2016(52)', '2015(52)', '2014(52)'], ['Basic earnings per share', 'Basic earnings per share', 'Basic earnings per share', 'Basic earnings per share', 'Basic earnings per share', 'Basic earnings per share'], ['Balance Sheet Information ($ in millions)']  
[[['Balance Sheet Information ($ in millions)', '2018(52)', '2017(53)', '2016(52)', '2015(52)', '2014(52)'], ['Merchandise inventory', '$2,131', '$2,131', '$2,131', '$2,131', '$2,131'], ['Other Data ($ and square footage in millions)']  
[[['Other Data ($ and square footage in millions)', '2018(52)', '2017(53)', '2016(52)', '2015(52)', '2014(52)'], ['Cash used for purchases of', 'Cash used for purchases of', 'Cash used for purchases of', 'Cash used for purchases of', 'Cash used for purchases of', 'Cash used for purchases of']]]
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