Optimizing Ulta's Digital Ad Spending

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Team 4

Our Team

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The Big Picture: Beauty Wars!

Industry Insights:

- **Loyalty Landscape:** Beauty ranks among the highest for brand loyalty in consumer goods
- **Locked-In Shoppers:** 67% of beauty customers buy *ONLY* from their preferred retailer
- **Sephora's Edge:** 25M+ *Beauty Insider (loyalty program)* members with an 80% retention rate

Core Problem:

- **Broad Ad Targeting = Overspending:**
  - Current digital ads cast too wide a net
  - Wastes spend on loyal Sephora shoppers
  - Highlights need for more precise ad targeting against Sephora loyalist customers

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Executive Summary

Executive Summary

We developed a cost-sensitive predictive model to **help Ulta optimize digital ad targeting** by identifying **users more likely to prefer Ulta** over Sephora.

Using behavioral and demographic data, we applied various supervised machine learning models that **prioritized high precision** to minimize costly false positives (Sephora loyalists).

This approach supports more efficient ad spend while enabling personalized, data-driven campaign strategies.
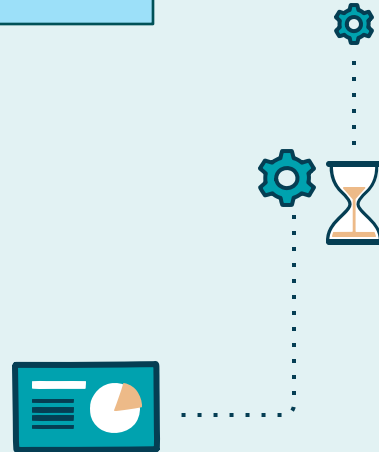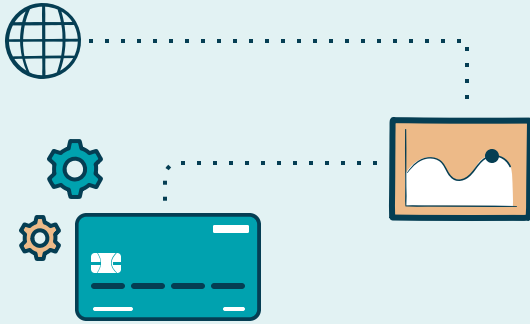
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Objective
Overview

Objectives Overview

Client Background:
A. Beauty Retailer
B. US-wide operations
C. Main competitor = Sephora

Business Problem:
A. Minimizing wasted ad spend cost on Sephora loyalists
B. Maximize ad spend on Ulta loyalists and or neutralists

Project Goal: Optimizing ad spend to reach new customers and retain current buyers

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Our Data

| clicks	sephora_cl	browsing_c	lastdate	gender	age	children_pr	hh_income	hh_si
16	0	875	5/26/2021	Female	33	No	40,000 - 59,	
3	4	937	7/31/2021	Female	54	No	200,000 or	5+
1	0	942	7/31/2021	Female	36	No	75,000 - 99,	
2	0	390	4/6/2021	Male	70	No	75,000 - 99,	
0	77	528	6/14/2020	Female	30	No	100,000 - 14	
33	0	705	12/6/2020	Male	72	No	60,000 - 74,	
0	23	603	8/26/2020	Female	59	No	100,000 - 14	
6	0	889	7/31/2021	Female	77	No	150,000 - 19	
7	0	942	7/31/2021	Female	52	No	100,000 - 14	5+
1	1	941	7/30/2021	Female	65	No	60,000 - 74,	
5	0	760	2/1/2021	Female	56	No	100,000 - 14	
21	0	941	7/31/2021	Female	23	No	200,000 or	
0	4	843	6/30/2021	Female	59	No	150,000 - 19	
11	4	942	7/31/2021	Female	47	No	100,000 - 14	
3	0	421	2/26/2020	Female	68	No	60,000 - 74,	
0	1	422	2/27/2020	Male	53	No	40,000 - 59,	
3	0	481	4/26/2020	Female	61	No	40,000 - 59,	
1	0	942	7/31/2021	Male	70	No	100,000 - 14	
3	0	942	7/31/2021	Female	72	No	100,000 - 14	
3	0	923	7/12/2021	Female	69	No	75,000 - 99,	
0	6	444	3/21/2020	Female	28	No	150,000 - 19	
51	1	942	7/31/2021	Female	60	No	100,000 - 14	
6	0	910	7/8/2021	Female	26	No	Less than 2	
0	4	909	7/1/2021	Female	23	No	100,000 - 14	
0	12	560	7/14/2020	Male	51	No	100,000 - 14	
0	15	821	4/1/2021	Female	39	No	100,000 - 14	
29	1	671	########	Female	34	No	Less than 2	
4	0	805	3/16/2021	Male	71	No	60,000 - 74,	
3	1	473	4/18/2020	Female	62	No	100,000 - 14	5+
0	5	646	10/8/2020	Male	41	No	100,000 - 14	
0	1	942	7/31/2021	Female	61	No	100,000 - 14	5+
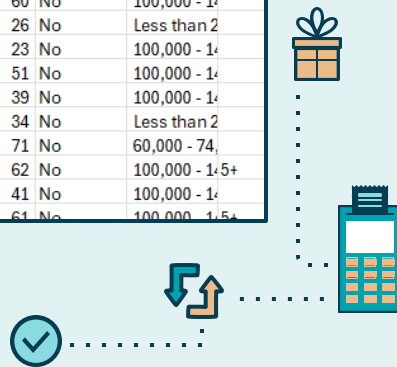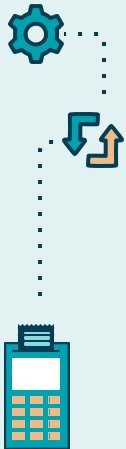
Feature Selection

We needed to focus on the Key Data:
Only care about Ulta/Sephora Website Online Interaction

Why is our <u>feature</u> selection relevant to this marketing plan?

Answer: Prevents Overfitting and Clutter
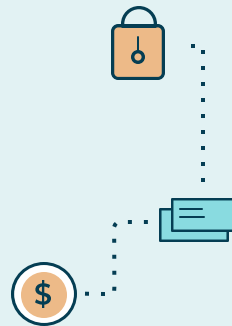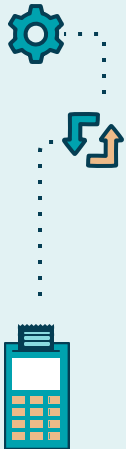
Proposed Solution

- Predictive classification model that identifies *likely* Ulta customers

- Uses digital browsing behavior and demographic data from 46,000+ users

- Focuses on the top 50 most predictive websites and engagement patterns

- Already showing strong early results in identifying the right customers and avoiding wasted ad spend.
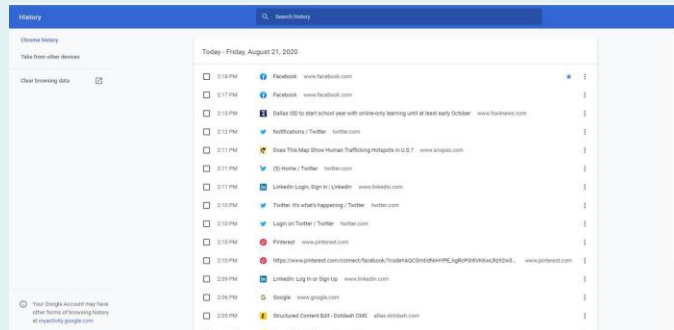
Used historical browsing history, what websites & how many visits
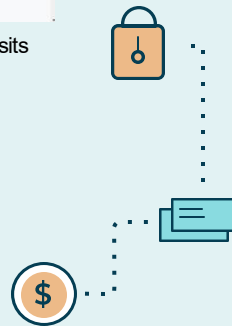
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Modeling Approach

Key Factors in Considering Modeling

Reduce Ad Spend

- Because incorrect Ulta Predictions are financially penalized, even a small increase in them can wipe out the savings from accurate predictions

Reach the Right Customer

- Ensures that when we spend ,money on an ad it doesn't not go to a Sephora Loyalist

Capture More Opportunities

- Captures more Ultra-Loyal users so we don't miss out on potential customer conversions

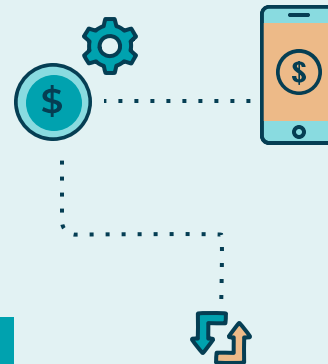## Test for Real-World Results

- Validate that performance holds up in real time conditions
- Prevent inflation or overfitting
- Ensure Cost Efficiency across users

Many Methods

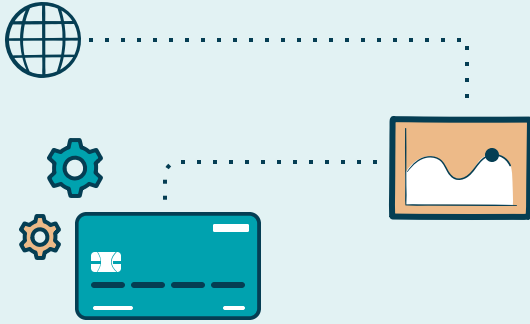Random Forest and K – N Nearest Neighbor

Over 100 runs

Changing parameters for each run

Profitable

Results
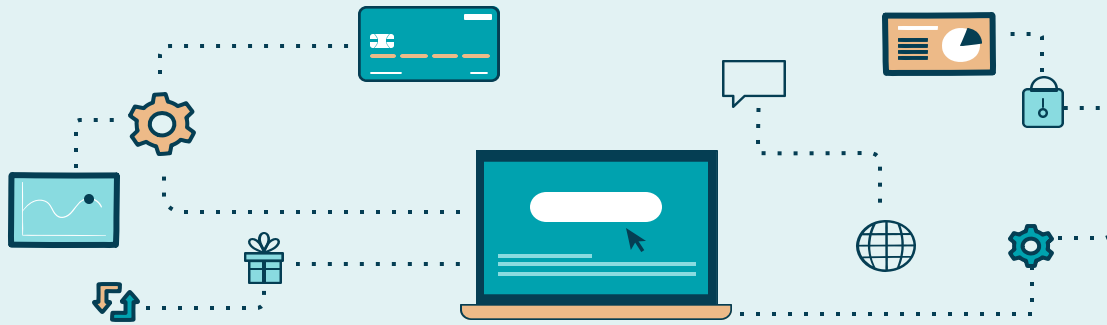
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Results and Evaluation

~9% Reduction in Costs

- Last year alone Ulta spent $422 on advertising

- 15% of this budget is spent on digital adds

- Implementing this model for digital adds would result in **5.5 million** in savings

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Strategy
Recommendations

Implementation

Given the growing importance of data in effective advertising we recomend that Ulta take a few steps in order to stay ahead of the curve...

- Implement and test our model for digital ad delivery
- Build in-house capabilites to produce and tune ML models
- Expand the use of these models beyond Digital ads leveraging data from other platforms such as TV and mail ads
- Using the method for holiday/special campaigns in the future
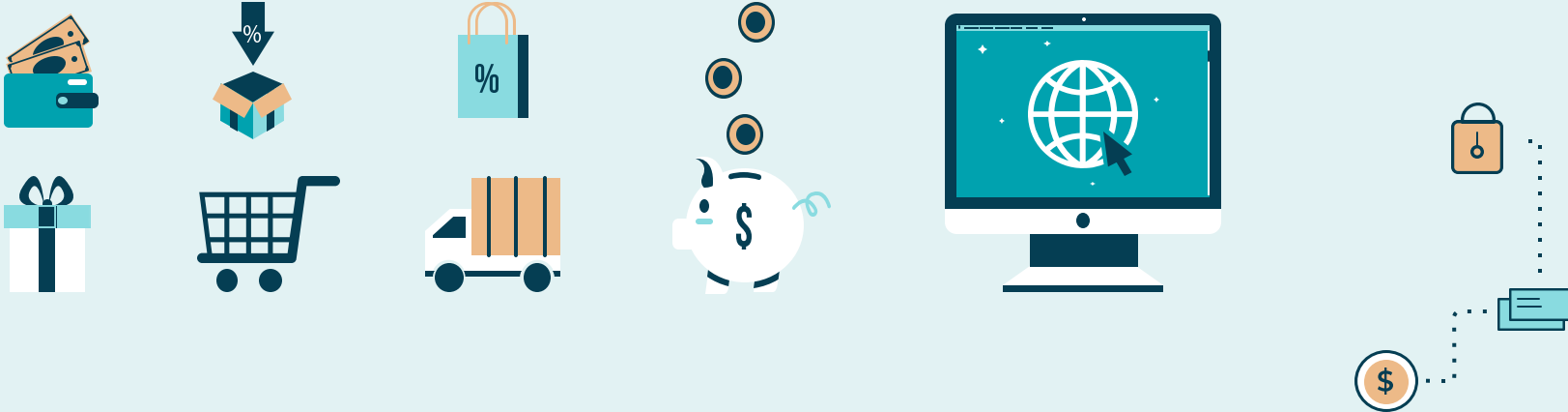
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