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Capstone Project:

Warby Parker Marketing Funnel Analysis

Learn SQL from Scratch

Bridget Mackinson

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Warby Parker Marketing Funnel Analysis

1. Get familiar with Warby Parker
2. Quiz Funnel - Survey Insights
3. Home Try-On Funnel - A/B Testing
4. Additional Insights

1. Get Familiar with Warby Parker

1.1 Get Familiar with Warby Parker - Marketing Funnels

Analyze different marketing funnels used by Warby Parker
to calculate conversion rates and identify actionable insights

Quiz Funnel

- To help users find their perfect frame, Warby Parker has a "Style Quiz" survey with the following questions:

    1. *"What are you looking for?"*
    2. *"What's your fit?"*
    3. *"Which shapes do you like?"*
    4. *"Which colors do you like?"*
    5. *"When was your last eye exam?"*

- Data is stored in `survey` table

Home Try-On Funnel

Take the Style Quiz → *Home Try-On* → *Purchase the Perfect Pair*

- Data is distributed across three tables:
    - `quiz`
    - `home_try_on`
    - `purchase`
- Home Try-On A/B Test
    - 50% of users will get 3 pairs to try on
    - 50% of users will get 5 pairs to try on

2. Quiz Funnel - Survey Insights

2.1 Quiz Funnel - “Style Quiz” Survey Table Columns

The users’ responses to the Warby Parker “Style Quiz” are stored in the ‘survey’ table with three columns:

- question: the text of the question to be answered starting with the number of the question
- user_id: unique identifier of user
- response: user response to the question

Women's Styles

I'm not sure. Let's skip it.

```sql
-- 1. What columns are in the survey table?
SELECT *
FROM survey
LIMIT 10;
```

question	user_id	response
1. What are you looking for?	005e7f99-d48c-4fce-b605-10506c85aaf7	
2. What's your fit?	005e7f99-d48c-4fce-b605-10506c85aaf7	Medium
3. Which shapes do you like?	00a556ed-f13e-4c67-8704-27e3573684cd	Round
4. Which colors do you like?	00a556ed-f13e-4c67-8704-27e3573684cd	Two-Tone
1. What are you looking for?	00a556ed-f13e-4c67-8704-27e3573684cd	
2. What's your fit?	00a556ed-f13e-4c67-8704-27e3573684cd	Narrow
5. When was your last eye exam?	00a556ed-f13e-4c67-8704-27e3573684cd	<1 Year
3. Which shapes do you like?	00bf9d63-0999-43a3-9e5b-9c372e6890d2	Square
5. When was your last eye exam?	00bf9d63-0999-43a3-9e5b-9c372e6890d2	<1 Year
2. What's your fit?	00bf9d63-0999-43a3-9e5b-9c372e6890d2	Medium

2.2 Quiz Funnel - Completion Rate by Question

Users “give up” at different points in the survey. What is the number of responses for each question? What are the completion rates by question?

- **Create a quiz funnel** using GROUP BY command.
- **Calculate the percentage of users who answer each question** using a spreadsheet program (divide number of people completing each question by number of people completing the previous question).

Which question(s) of the quiz have a lower completion rates? What do you think is the reason?

- **#5: When was your last eye exam? → lowest completion rate at 74.8%.** Users may not remember off hand and requires them to take additional action to answer the question. Consider whether this question is critical to moving users to home try-on step.
- **#3: Which shapes do you like? → 80% completion rate.** Users may not be able to easily visualize how different shapes will look on them or they might be looking to try something new/different. Consider options for using augmented reality via webcam or more visuals embedded in the survey to encourage completion.

question	completed_resp	completion_rate
1. What are you looking for?	500	100.0%
2. What's your fit?	475	95.0%
3. Which shapes do you like?	380	80.0%
4. Which colors do you like?	361	95.0%
5. When was your last eye exam?	270	74.8%

```
-- 2. What is the number of responses for each question?
SELECT question, COUNT(DISTINCT user_id) AS 'completed_resp'
FROM survey
WHERE response IS NOT NULL
GROUP BY question;
```

3. Home Try-On Funnel - A/B Test Insights

3.1 Home Try-On Funnel - Table Structure

Warby Parker's purchase funnel data is distributed across three tables:

- quiz
- home_try_on
- purchase

Home Try-On A/B Test

- 50% of users will get 3 pairs to try on
- 50% of users will get 5 pairs to try on

145 New York 9a

383 Madison Ave

347 Madison Square N

```sql
-- 4. Examine the first 5 rows of each Home Try-On table. What are the column names?
SELECT *
FROM quiz
LIMIT 5;

SELECT *
FROM home_try_on
LIMIT 5;

SELECT *
FROM purchase
LIMIT 5;
```

quiz

user_id	style	fit	shape	color
4e8118dc-bb3d-49bf-85fc-cca8d83232ac	Women's Styles	Medium	Rectangular	Tortoise
291f1cca-e507-48be-b063-002b14906468	Women's Styles	Narrow	Round	Black
75122300-0736-4087-b6d8-c0c5373a1a04	Women's Styles	Wide	Rectangular	Two-Tone
75bc6ebd-40cd-4e1d-a301-27ddd93b12e2	Women's Styles	Narrow	Square	Two-Tone

home_try_on

user_id	number_of_pairs	address
d8addd87-3217-4429-9a01-d56d68111da7	5 pairs	
f52b07c8-abe4-4f4a-9d39-ba9fc9a184cc	5 pairs	
8ba0d2d5-1a31-403e-9fa5-79540f8477f9	5 pairs	287 Pell St
4e71850e-8bbf-4e6b-accc-49a7bb46c586	3 pairs	

purchase

user_id	product_id	style	model_name	color	price
00a9dd17-36c8-430c-9d76-df49d4197dcf	8	Women's Styles	Lucy	Jet Black	150
00e15fe0-c86f-4818-9c63-3422211baa97	7	Women's Styles	Lucy	Elderflower Crystal	150
017506f7-aba1-4b9d-8b7b-f4426e71b8ca	4	Men's Styles	Dawes	Jet Black	150
0176bfb3-9c51-4b1c-b593-87edab3c54cb	10	Women's Styles	Eugene Narrow	Rosewood Tortoise	95

3.2 Home Try-On - A/B Test Analysis

Analysis Objective: Are users that receive more glasses to try on at home more likely to make a purchase?

- **First, create a new table** where each row represents a single user with the following columns:
  - user_id: unique user identifier consistent across the original tables.
  - is_home_try_on: If the user has any entries in home_try_on, then 'True'.
  - number_of_pairs: from the home_try_on table (NULL, 3, or 5).
  - is_purchase: if the user has any entries in is_purchase, then 'True'.
- **Combine the three tables** using a LEFT JOIN, starting with the top of the funnel (quiz) moving to middle of the funnel (home_try_on) and ending with bottom of the funnel (purchase).

user_id	is_home_try_on	number_of_pairs	is_purchase
4e8118dc-bb3d-49bf-85fc-cca8d83232ac	1	3 pairs	0
291f1cca-e507-48be-b063-002b14906468	1	3 pairs	1
75122300-0736-4087-b6d8-c0c5373a1a04	0	NULL	0
75bc6ebd-40cd-4e1d-a301-27ddd93b12e2	1	5 pairs	0
ce965c4d-7a2b-4db6-9847-601747fa7812	1	3 pairs	1
28867d12-27a6-4e6a-a5fb-8bb5440117ae	1	5 pairs	1
5a7a7e13-fbcf-46e4-9093-79799649d6c5	0	NULL	0
0143cb8b-bb81-4916-9750-ce956c9f9bd9	0	NULL	0
a4ccc1b3-cbb6-449c-b7a5-03af42c97433	1	5 pairs	0
b1dded76-cd60-4222-82cb-f6d464104298	1	3 pairs	0

```sql
-- 5.  Create a new table containing user_id, is_home_try_on, number_of_pairs, and is_purchase.
SELECT DISTINCT q.user_id,
  hto.user_id IS NOT NULL AS 'is_home_try_on',
  hto.number_of_pairs,
  p.user_id IS NOT NULL AS 'is_purchase'
FROM quiz AS 'q'
LEFT JOIN home_try_on AS 'hto'
  ON q.user_id = hto.user_id
LEFT JOIN purchase AS 'p'
  ON q.user_id = p.user_id
LIMIT 10;
```

3.2 Home Try-On Funnel - A/B Test Analysis (cont.)

Use new table to calculate the difference in purchase rates between customers who received 3 pairs of glasses and customers who received 5 pairs of glasses.

- **Put newly created table in a WITH statement** and give the temporary table the name '**wpfunnel**'.
- Include the following columns:
  - number_of_pairs: the number of pairs of glasses users received to try on at home.
  - num_quiz: sums the number of users that completed the quiz
  - num_hto: sums 'is_home_try_on' to get aggregate count of users that received glasses to try on at home.
  - num_purch: sums 'is_purchase' to get aggregate count of users that made a purchase.
  - % from q to hto: calculates the % of users from quiz completion to home try-on.
  - % from hto to p: calculates the %of users from home try-on request to purchase.
- Use GROUP BY command to calculate the number of customers who completed quiz, received home try ons, and made a purchase by the number of pairs they received to try-on at home.

```sql
WITH wpfunnel AS (
SELECT DISTINCT q.user_id,
  hto.user_id IS NOT NULL AS 'is_home_try_on',
  hto.number_of_pairs,
  p.user_id IS NOT NULL AS 'is_purchase'
FROM quiz AS 'q'
LEFT JOIN home_try_on AS 'hto'
  ON q.user_id = hto.user_id
LEFT JOIN purchase AS 'p'
  ON q.user_id = p.user_id)
SELECT
  number_of_pairs,
  COUNT(*) AS 'num_quiz',
  SUM(is_home_try_on) AS 'num_hto',
  SUM(is_purchase) AS 'num_purch',
  ROUND((1.0 * SUM(is_home_try_on) / COUNT(user_id)),2) AS '% from q to hto',
  ROUND((1.0 * SUM(is_purchase) / SUM(is_home_try_on)),2) AS '% from hto to p'
FROM wpfunnel
GROUP BY 1
ORDER BY 1;
```

number_of_pairs	num_quiz	num_hto	num_purch	% from q to hto	% from hto to p
NULL	250	0	0	0.0	NULL
3 pairs	379	379	201	1.0	0.53
5 pairs	371	371	294	1.0	0.79

Customers that receive more glasses to try-on at home ARE MORE LIKELY TO MAKE A PURCHASE.

The conversion rate for customers that received 5 pairs is 79% which is higher than the conversion rate of customers that received only 3 pairs at 53%.

4. Warby Parker Marketing Funnels - Additional Analysis

4.1 Conversion Rates

Compare conversion from quiz → home try-on, and home try-on → purchase.

- Use ‘wpfunnel’ temporary table created for A/B test analysis.
- Include the following columns (mostly the same except ‘number of pairs’ is not needed for the overall conversion rate):
  - num_quiz: sums the number of users that completed the quiz
  - num_hto: sums ‘is_home_try_on’ to get aggregate count of users that received glasses to try on at home.
  - num_purch: sums ‘is_purchase’ to get aggregate count of users that made a purchase.
  - % from q to hto: calculates the % of users from quiz completion to home try-on.
  - % from hto to p: calculates the %of users from home try-on request to purchase.

num_quiz	num_hto	num_purch	% from q to hto	% from hto to p
1000	750	495	0.75	0.66

```sql
WITH wpfunnel AS (
SELECT DISTINCT q.user_id,
  hto.user_id IS NOT NULL AS 'is_home_try_on',
  hto.number_of_pairs,
  p.user_id IS NOT NULL AS 'is_purchase'
FROM quiz AS 'q'
LEFT JOIN home_try_on AS 'hto'
  ON q.user_id = hto.user_id
LEFT JOIN purchase AS 'p'
  ON q.user_id = p.user_id)
SELECT COUNT(*) AS 'num_quiz',
  SUM(is_home_try_on) AS 'num_hto',
  SUM(is_purchase) AS 'num_purch',
  1.0 * SUM(is_home_try_on) / COUNT(user_id) AS '% from q to hto',
  1.0 * SUM(is_purchase) / SUM(is_home_try_on) AS '% from hto to p'
FROM wpfunnel;
```

75% of users that complete the quiz move to home try-on step in the funnel.
66% of users that try-on glasses at home make a purchase.

4.2 Most Common Purchases - By Style

Analyze conversion rates from quiz → home try-on, and home try-on → purchase BY STYLE.

- Use new temporary table style_funnel with the following columns:
  - style: style options.
  - num_quiz: sums the number of users that completed the quiz
  - num_hto: sums 'is_home_try_on' to get aggregate count of users that received glasses to try on at home.
  - num_purch: sums 'is_purchase' to get aggregate count of users that made a purchase.
  - % from q to hto: calculates the % of users from quiz completion to home try-on.
  - % from hto to p: calculates the %of users from home try-on request to purchase.
- Use GROUP BY command to calculate the number of customers who completed quiz, received home try ons, and made a purchase by Style.

style	num_quiz	num_hto	num_purch	% from q to hto	% from hto to p
Men's Styles	432	320	243	0.74	0.76
Women's Styles	469	361	252	0.77	0.7
I'm not sure. Let's skip it.	99	69	0	0.7	0.0

```sql
WITH style_funnel AS (
SELECT DISTINCT q.user_id,
  q.style,
  hto.user_id IS NOT NULL AS 'is_home_try_on',
  p.user_id IS NOT NULL AS 'is_purchase'
FROM quiz AS 'q'
  LEFT JOIN home_try_on AS 'hto'
    ON q.user_id = hto.user_id
  LEFT JOIN purchase AS 'p'
    ON q.user_id = p.user_id)
SELECT
  style,
  COUNT(*) AS 'num_quiz',
  SUM(is_home_try_on) AS 'num_hto',
  SUM(is_purchase) AS 'num_purch',
  ROUND(1.0 * SUM(is_home_try_on) / COUNT(user_id),2) AS '% from q to hto',
  ROUND(1.0 * SUM(is_purchase) / SUM(is_home_try_on),2) AS '% from hto to p'
FROM style_funnel
GROUP BY 1
ORDER BY 6 DESC;
```

0% of users that responded "I'm not sure. Let's skip it." ultimately made a purchase.

Conversion rates for Men's Styles and Women's Styles are fairly similar for both quiz → home try-on AND home try-on → purchase.

4.3 Most Common Purchases - By Color

Analyze conversion rates from quiz → home try-on, and home try-on → purchase BY COLOR.

- Use new temporary table '**color_funnel**' with the following columns:
  - color: the product color options.
  - num_quiz: sums the number of users that completed the quiz.
  - num_hto: sums 'is_home_try_on' to get aggregate count of users that received glasses to try on at home.
  - num_purch: sums 'is_purchase' to get aggregate count of users that made a purchase.
  - % from q to hto: calculates the % of users from quiz completion to home try-on.
  - % from hto to p: calculates the %of users from home try-on request to purchase.
- Use GROUP BY command to calculate the number of customers who completed quiz, received home try ons, and made a purchase by Color.

color	num_quiz	num_hto	num_purch	% from q to hto	% from hto to p
Black	280	220	150	0.79	0.68
Tortoise	292	213	144	0.73	0.68
Two-Tone	104	73	49	0.7	0.67
Crystal	210	165	104	0.79	0.63
Neutral	114	79	48	0.69	0.61

```sql
WITH color_funnel AS (
SELECT DISTINCT q.user_id,
  q.color,
  hto.user_id IS NOT NULL AS 'is_home_try_on',
  p.user_id IS NOT NULL AS 'is_purchase'
FROM quiz AS 'q'
  LEFT JOIN home_try_on AS 'hto'
    ON q.user_id = hto.user_id
  LEFT JOIN purchase AS 'p'
    ON q.user_id = p.user_id)
SELECT
  color,
  COUNT(*) AS 'num_quiz',
  SUM(is_home_try_on) AS 'num_hto',
  SUM(is_purchase) AS 'num_purch',
  ROUND(1.0 * SUM(is_home_try_on) / COUNT(user_id),2) AS '% from q to hto',
  ROUND(1.0 * SUM(is_purchase) / SUM(is_home_try_on),2) AS '% from hto to p'
FROM color_funnel
GROUP BY 1
ORDER BY 6 DESC;
```

While Crystal color is tied for highest quiz → Home Try-On conversion rate, it has second lowest Home Try-On → Purchase conversion rate.