Maven Fuzzy Factory

Optimizing Homepage Performance:

A/B Test Analysis

Presented By:

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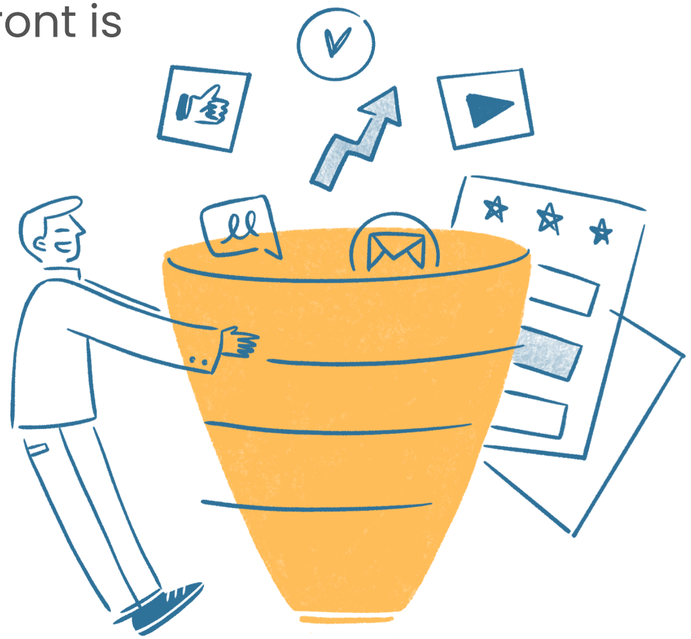
Company Overview

Fuzzy Factory

Fuzzy Factory is an e-commerce startup selling specialty toys like their flagship 'Mr. Fuzzy' bear.

Because they are an online-only business, their entire storefront is their ***website***.



The Growth Challenge

Acquisition
The company relies heavily on paid traffic (Google Ads) to drive visitors to the site.

Conversion
While *traffic is high*, *retention* is the *current bottleneck.*

The "Leak"
A ***60% homepage bounce rate*** means the company is paying for clicks that don't result in engagement, wasting marketing budget and stunting growth.

Project Brief

Object 1

Filter the website traffic and prepare the dataset for the analysis

Object 2

Calculate the number of sessions, bounced sessions, and bounce rate for each of the landing pages

Object 3

Verify the significance

The W*ebsite Manager* has decided to test a new landing page with a subset of visitors in order to reduce the homepage's high bounce rate.

As **Marketing Analyst** for the company my main task is to analyze the results of the A/B test to see if the new landing page drove a statistically significant improvement.

Object 1

Dataset acquisition & Website traffic filtering

Assumptions

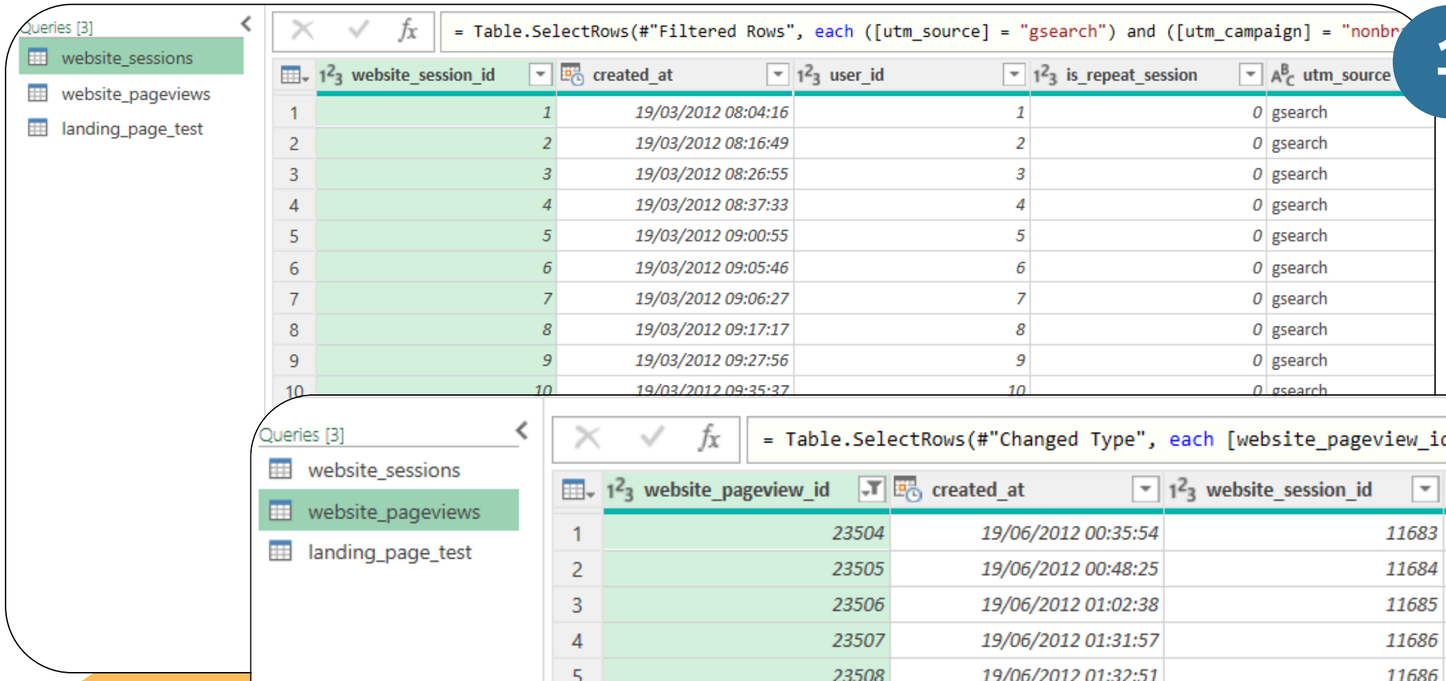
- We are ***testing a new landing page*** (*/lander-1*) against the original homepage to see if we can keep users on the site longer.
- To ensure the data is "clean," we are only looking at **new, unbiased users** coming from **Google Search** who **don't already know our brand.**
- Google Search traffic from **non-branded keywords** was split **50/50 between the original and new landing pages** until the end of the test (July 28, 2012).

Dataset View

- E-Commerce database with 30K+ orders from 400K+ website sessions.

Filter & Transform Data

Excel Power Query is the primary tool used to prepare and transform the dataset for analysis.



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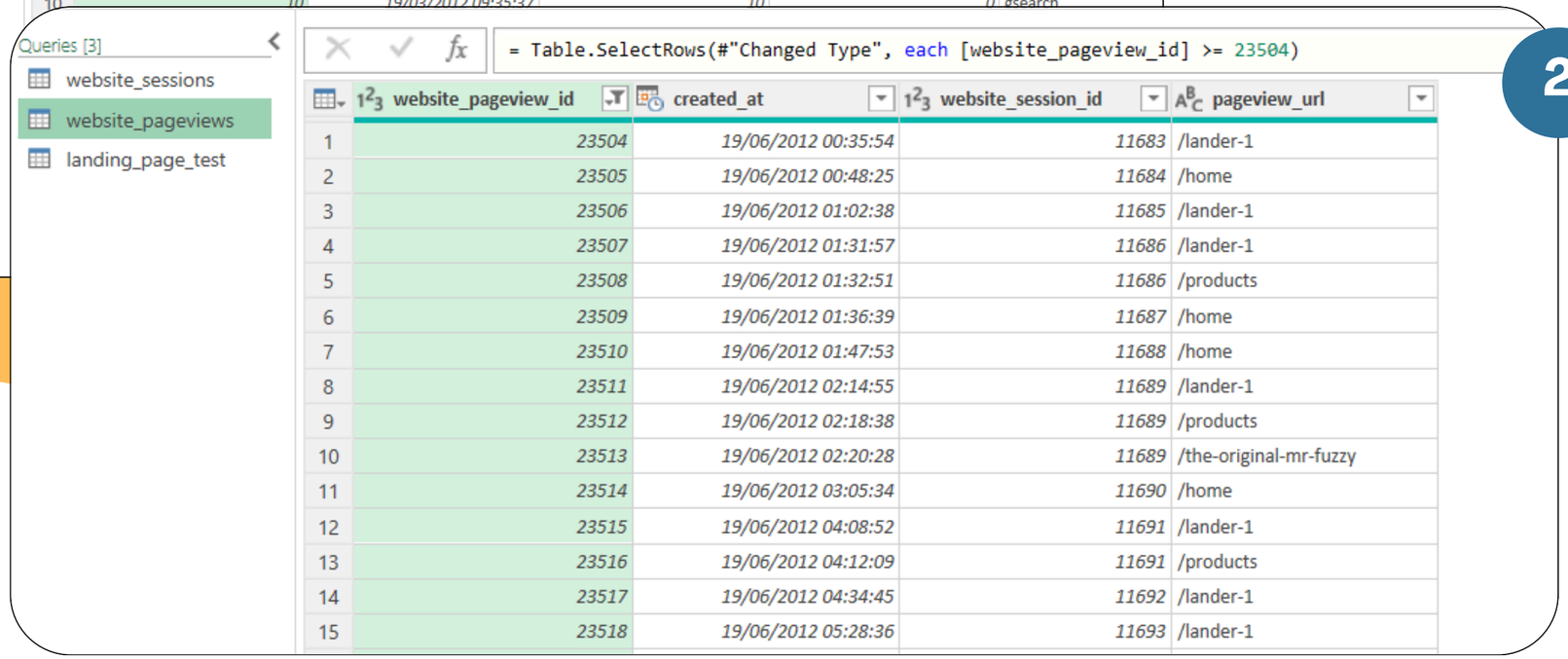
Imported Website_sessions CSV file into Excel PowerQuery and filtered all traffic before July 28, 2012 with "**gsearch**" as the **utm_source** and "**nonbrand**" as the **utm_campaign**



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In the website pageviews table, found the ***pageview_id*** for the first visit to the new landing page, to mark the start of the A/B test and removed any pageviews prior

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An **"inner join"** was applied between the two tables to isolate only the records relevant to the landing page test.

Object 2

Bounce rate calculation

To determine the winner of the A/B test, the raw data was processed through three key steps:

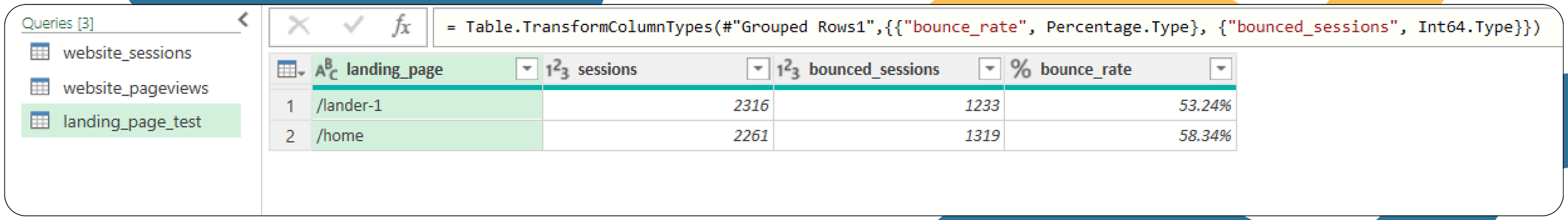
1. **Landing Page Identification:** Extracted the first pageview_url for every session to distinguish between the Control (/home) and the Variant (/lander-1).

2. **Bounced Session Logic:** Created a binary bounced column. A session is flagged as 1 (Bounced) if the total pageview count equals 1; otherwise, it is flagged as 0.

3. **Metric Aggregation:** Grouped the data by landing page to calculate total sessions, total bounces, and the final Bounce Rate (Bounced Sessions / Total Sessions).

- **Performance Improvement:** The new landing page (*/lander-1*) achieved a 5.1% absolute reduction in bounce rate.
- **Initial Takeaway:** At first glance, the new landing page is a clear improvement, successfully retaining a higher percentage of "non-brand" search traffic compared to the original homepage.

BUT IS THIS IMPROVEMENT STATISTICALLY SIGNIFICANT?

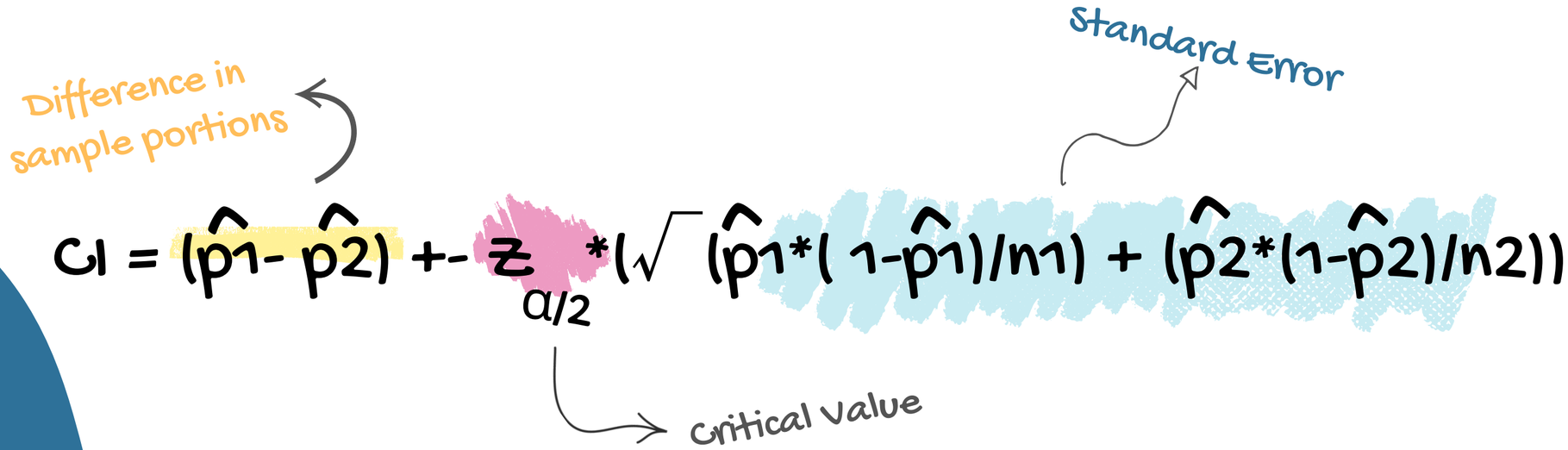


	landing_page	sessions	bounced_sessions	bounce_rate
1	/lander-1	2316	1233	53.24%
2	/home	2261	1319	58.34%

Object 3

Verify the significance

The final objective is to use a **confidence interval** to check if the difference in bounce rates is statistically significant.



Validating Results: Statistical Significance

The Mathematical Framework

To confirm the **5.1% improvement** was **statistically valid**, we performed a **Z-Test** for Proportions with a **95% Confidence Level.**

landing_page	sessions	bounced_sessions	bounce_rate	1-p
/lander-1	2316	1233	53.2%	46.8%
/home	2261	1319	58.3%	41.7%

$\hat{p_1} - \hat{p_2} = 5.1\%$

1

- **Success Rate (1-p):** Calculated the "**retention rate**" (sessions that did not bounce) for both pages.
- **Point Estimate:** The observed difference between the two bounce rates (58.34% - 53.24% = 5.1%).

2

Confidence level: 95%

Alpha: 0.05

Alpha/2: 0.025

Z: -1.96

Critical Value

Validating Results: Statistical Significance

The Mathematical Framework

3 **Margin of Error:** Calculated using the **Standard Error** to determine the range of certainty around our estimate.

Standard Error: 0.0147

Margin of Error: -1.96 * 0.0147 = -0.029

4 **Confidence Interval Results:** Based on the calculations, we establish the **Lower** and **Upper Limits** for the difference in performance.

Lower limit: 5.1% +(- 2.9%) = 2.2%

Upper limit: 5.1% - (-2.9%) = 8%

Status: Statistically significant
(Since the interval does not contain 0)

There is a **95% probability** that the homepage bounce rate is **between 2.2% and 8% higher** than the landing page bounce rate.

Business Conclusion

Reliability:

We are 95% confident that the new landing page (/lander-1) genuinely performs better than the original homepage.

Recommendation:

- Permanent adoption of the new landing page for all **gsearch nonbrand traffic** to maximize marketing ROI.
- **Iterative Testing:** Now that we have a new "Control," the next step is to test **high-impact elements on this page** (e.g., CTA button colors or hero images) to drive the bounce rate even lower.
- **Device Optimization:** Conduct a **secondary analysis** to see if the bounce rate differs significantly between **Mobile** and **Desktop** to identify further optimization opportunities

Thank You Very Much!

Contacts

Website

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