



Data-Driven Growth Strategy for a Digital Toy Retailer

Dashboard Analysis for the Stakeholders

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Business Context

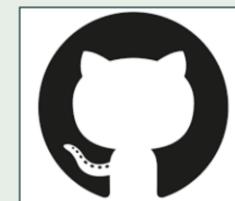
- ❖ A newly launched **e-commerce startup** sells **stuffed animal toys** online.
- ❖ The company is preparing for its **next round of funding** and wants to showcase a **data-driven growth story**.
- ❖ The CEO, **Cindy Sharp**, has requested detailed **dashboards and performance analysis** to support stakeholder decisions and investor confidence.
- ❖ The focus is on building **stakeholder-specific dashboards**, performing in-depth analytics, and crafting a compelling **investor pitch deck** using business data.





Technology Stack

Tool/Tech	Purpose
Excel	For initial data overview
PowerPoint	Creating presentations for deliverables, investor pitch decks, and stakeholder reviews.
SQL Server	Store, join, and query structured e-commerce data efficiently.
Power BI	Create dynamic dashboards for stakeholders (CEO, Website Manager, Marketing Director).
Python (Jupyter)	Perform deep-dive exploratory data analysis (EDA), behavioral segmentation, and model-based insights.
Streamlit	Build a web application showcasing interactive analytical outputs.
GitHub	Centralize version control, code sharing, and documentation for the entire project lifecycle.





Data Available

Database	Table Name	Description	Key Fields
Orders	orders	Records all customer orders. Each row represents a unique order made by a user.	order_id, created_at, user_id, website_session_id, product_id, product_quantity, price_usd, cogs_usd
	order_items	Shows individual items within each order. Supports cross-sell analysis and contains pricing details.	order_item_id, created_at, is_primary_item, product_id, price_usd, cogs_usd
	order_item_refunds	Captures refund transactions per item, helpful for product quality tracking and refund rate analysis.	order_item_refund_id, created_at, refund_amount_usd
Website	website_sessions	Tracks website session-level info including UTM parameters for marketing attribution. Used to analyze traffic sources, repeat sessions, and device-level behavior.	website_session_id, created_at, utm_source, utm_campaign, utm_content, device_type, user_id
	website_pageviews	Records pageviews within each website session. Used for pathing, funnel creation, and bounce rate analysis.	website_session_id, pageview_url, created_at
Products	products	Product-level metadata including creation date and product name. Supports new product launch tracking and product-level sales/margin analysis.	product_id, created_at, product_name



Data Dictionary

TableName	Dimension	ColumnName	DataType	MaxLength	Description	Example Values
orders	32313×8	order_id created_at website_session_id user_id primary_product_id items_purchased price_usd cogs_usd	int datetime2 int int int int float float	4 8 4 4 4 4 8 8	Unique order ID Order timestamp Source session ID Customer/user reference Key product sold No. of items in order Total price Total cost	1001, 1002, ... 4/9/2012 7:56 911, 912, etc. 469 1, 2, 3, 4 1, 2 19.99, 29.98 7.50, 10.00
order_items	40025×7	order_item_id created_at order_id product_id is_primary_item price_usd cogs_usd	int datetime2 int int int float float	4 8 4 4 4 8 8	Unique order item ID Time item added Related order ID Product reference Whether primary product Selling price Cost of goods sold	231, 299, etc. 2012-04-09 07:56:59 1001 1, 2, 3 1 = Yes, 0 = No 9.99, 19.99 3.00, 7.50
order_item_refunds	1731×5	order_item_refund_id created_at order_item_id order_id refund_amount_usd	int datetime2 int int float	4 8 4 4 8	Unique refund record ID Refund timestamp Links to order_items Links to orders Refund value in USD	401, 402 2012-04-12 15:16:10 299 1002 9.99



Data Dictionary

TableName	Dimension	ColumnName	DataType	MaxLength	Description	Example Values
website_sessions	472871×9	website_session_id created_at user_id is_repeat_session utm_source utm_campaign utm_content device_type http_referer	int datetime2 int int nvarchar nvarchar nvarchar nvarchar nvarchar	4 8 4 4 100 100 100 100 100	Unique session ID Session start time Who visited Repeat visit? Marketing source Campaign name Ad creative or version Device used Previous URL	122, 2003 2012-04-09 07:48:00 469 0, 1 gsearch, bsearch, socialbook nonbrand, brand banner-1, test-A desktop, mobile https://google.com
website_pageviews	1188124×4	website_pageview_id created_at website_session_id pageview_url	int datetime2 int nvarchar	4 8 4 100	Unique pageview ID Pageview time Session reference Page URL	99999 2012-04-09 07:56:58 911 /products , /billing , /home
products	4×3	product_id created_at product_name	int datetime2 nvarchar	4 8 100	Product ID Product creation date Product name	1, 2, 3, 4 2011-12-05 The Original Mr. Fuzzy, The Forever Love Bear, The Birthday Sugar Panda, The Hudson River Mini bear



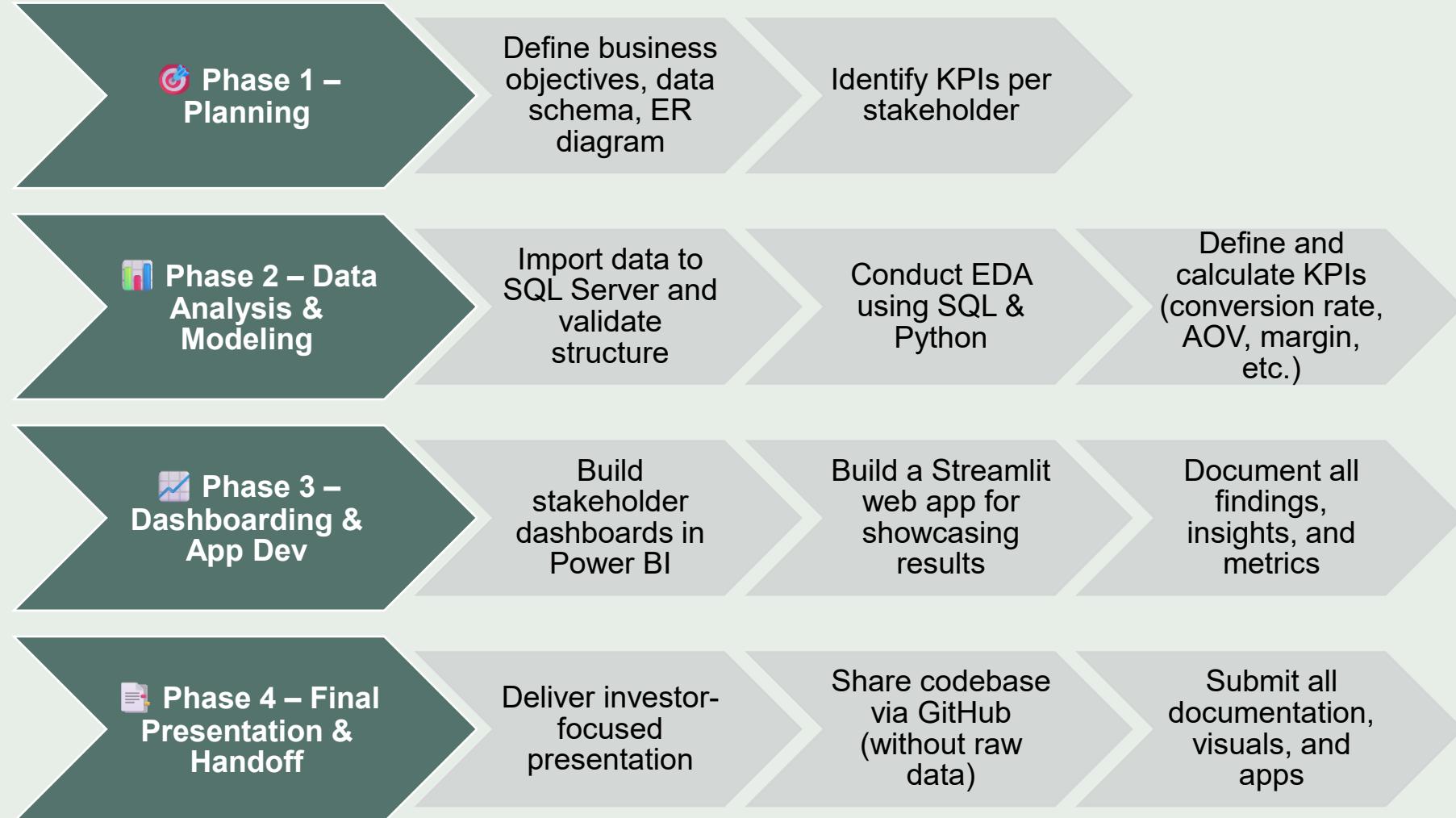
Problem Statement



- The company lacks a structured system to monitor **key performance metrics**, track **website and product performance**, and assess **channel effectiveness**.
- The **analytics team** is tasked with developing dashboards, analyzing product and traffic data, and preparing a **growth-oriented story** for potential investors.
- Stakeholders need insights across multiple dimensions:
 - **CEO**: Business growth, product performance, portfolio impact.
 - **Marketing Director**: Channel ROI, repeat visitors, bid optimization.
 - **Website Manager**: Conversion paths, bounce rate, website flow.



List of Outputs to Generate (Project Tasks)



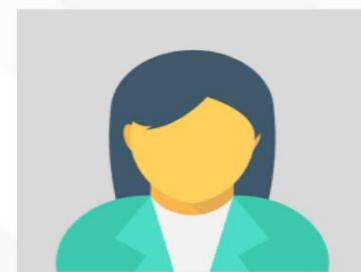


Assumptions, Clarifications & Dependencies

- All six datasets are clean, complete, and accurately reflect business operations.
- Stakeholders will be available for periodic feedback and requirement clarifications.
- There is no additional historical data beyond what has been provided.
- Internet access is available for API tools like GitHub and Streamlit hosting.
- Marketing channel names (e.g., gsearch, bsearch) follow consistent naming conventions.
- Analysis will focus on data up to the **latest complete quarter** unless specified otherwise.



Dashboards for Stakeholders



Name: Cindy Sharp
Role : CEO



Name: Morgan Rockwell
Role : Website Manager



Name: Tom Parmesan
Role : Marketing Manager

This dashboard provides a concise, high-level overview of key performance metrics essential for strategic decision-making in e-commerce. It highlights critical areas such as user behavior, customer segmentation, acquisition channels, and device performance, enabling the CEO to quickly grasp the health and trajectory of the business.

- Visit the Dashboard -

<https://app.powerbi.com/view?r=eyJrljoiZTIwM2EwMmEtZjliMi00YjRjLTk1ODMtN2YxNzQyNDZjMDFiliwidCI6IjgxMjEwNDM2LTRmZGMtNDMwZC1iYjU5LTI3NTlhNzBjYTk1YyJ9&pageName=de47d37aba0e3207b502>



Dashboards for Stakeholders

E-Commerce Digital Product Analytics

Homepage

Marketing Channel Performance

User Engagement & Session Behavior

Traffic Source & Segment Trends

Attribution & Conversion Journey

Product Performance

Stakeholders:

- Name: Cindy Sharp
Role : CEO
- Name: Morgan Rockwell
Role : Website Manager
- Name: Tom Parmesan
Role : Marketing Manager



Marketing Channel Performance

1. Which channels generate the highest gross revenue?
2. Which marketing source drives the most traffic?
3. Which campaign has the highest conversion rate?
4. How does device type influence channel performance?
5. Which channels have the highest bounce rate?
6. Which channel generates better profit margins?
7. How do repeat orders affect performance by source?





Marketing Channel Performance

Marketing Channel Performance

Clear all
slicersHome

Gross Revenue
1.94M

Total Orders
32.31K

Revenue per Channel

gsearch	1,276,144.93
bsearch	268,672.51
socialbook	

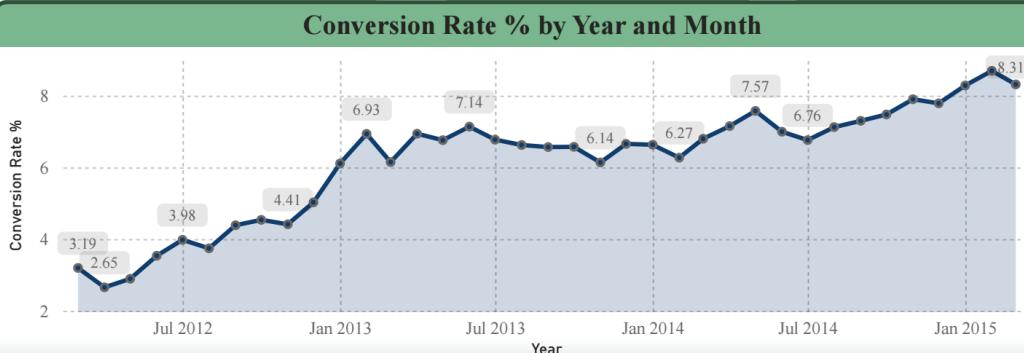
Conversion Rate %
6.83

Bounce Rate %
44.76

Repeat Session Rate
16.61

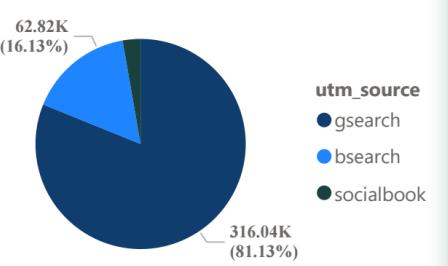
Gross Profit %
58.33

Conversion Rate % by Year and Month



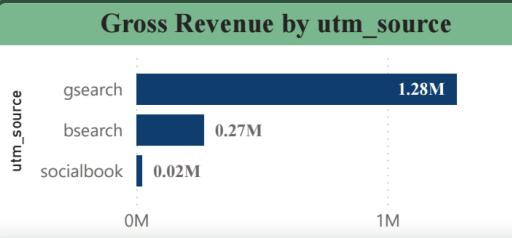
Date	Conversion Rate %
Jul 2012	3.19
Aug 2012	2.65
Sep 2012	3.98
Oct 2012	4.41
Nov 2012	5.00
Dec 2012	6.93
Jan 2013	6.93
Feb 2013	7.14
Mar 2013	6.50
Apr 2013	6.50
May 2013	6.50
Jun 2013	6.50
Jul 2013	7.14
Aug 2013	6.50
Sep 2013	6.50
Oct 2013	6.50
Nov 2013	6.50
Dec 2013	6.50
Jan 2014	6.14
Feb 2014	6.27
Mar 2014	6.27
Apr 2014	6.27
May 2014	7.57
Jun 2014	7.57
Jul 2014	6.76
Aug 2014	6.76
Sep 2014	6.76
Oct 2014	6.76
Nov 2014	6.76
Dec 2014	7.14
Jan 2015	7.14
Feb 2015	8.31

Total Sessions by utm_source



utm_source	Sessions	Percentage
gsearch	62.82K	16.13%
bsearch	316.04K	81.13%
socialbook	1.00K	0.00%

Gross Revenue by utm_source



utm_source	Gross Revenue
gsearch	1.28M
bsearch	0.27M
socialbook	0.02M

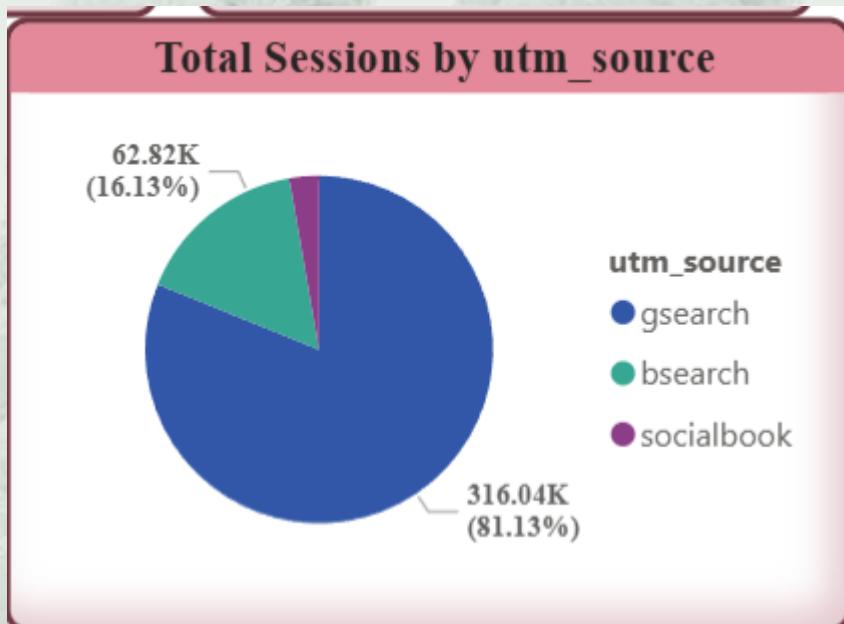
Channel Sources vs KPIs

utm_source	Total Sessions	Bounce Rate %	AOV	Conversion Rate %	Gross Profit %	Sessions per User
bsearch	62823	47.48	59.45	7.19	58.39	13.92
gsearch	316035	44.39	59.82	6.75	58.23	14.89
socialbook	10685	77.63	64.90	3.21	58.72	31.15



Marketing Channel Performance

2. Which marketing source drives the most traffic?



Observations:

- Gsearch is the dominant traffic driver, accounting for over 81% of total sessions.
- Bsearch contributes a moderate portion (~16%), while Socialbook traffic is minimal.
- Traffic distribution is highly skewed toward a single source, indicating reliance on gsearch.

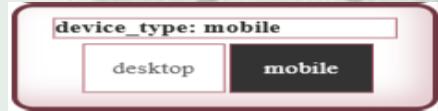
Recommendations:

- Diversify marketing channels to reduce overdependence on gsearch and improve reach.
- Explore growth opportunities in underperforming sources like socialbook through targeted campaigns.



Marketing Channel Performance

4. How does device type influence channel performance?



Channel Sources vs KPIs						
utm_source	Total Sessions	Bounce Rate %	AOV	Conversion Rate %	Gross Profit %	Sessions per User
bsearch	54262	45.80	59.39	7.85	58.47	12.75
gsearch	215077	41.24	59.70	8.43	58.22	11.91
socialbook	6112	69.11	64.50	4.99	58.58	20.04

Channel Sources vs KPIs						
utm_source	Total Sessions	Bounce Rate %	AOV	Conversion Rate %	Gross Profit %	Sessions per User
bsearch	8561	58.11	60.44	3.01	57.04	33.18
gsearch	100958	51.08	60.49	3.17	58.30	31.61
socialbook	4573	89.02	68.04	0.83	59.78	120.34

Observations:

Desktop:

- **Gsearch** leads in sessions and has the **highest conversion rate (8.43%)**.
- **Socialbook** shows high **sessions per user (20.04)** but relatively **low conversions (4.99%)**.
- **Bsearch** is steady but slightly behind in AOV and bounce rate compared to others.

Mobile:

- Conversion rates **drop sharply** across all channels—especially **socialbook (0.83%)**.
- **Socialbook** has **extremely high sessions per user (120.34)** but **very poor conversion efficiency**.
- **Bounce rates are higher** on mobile (e.g., 89.02% for socialbook), indicating weaker engagement.

Recommendations:

- Optimize mobile experience—especially landing pages and checkout—for better conversions.
- Investigate socialbook's mobile traffic behavior: high engagement (sessions/user) but low conversions could signal friction in funnel or intent mismatch.
- Consider device-specific campaigns for gsearch, leveraging its consistent performance.



Marketing Channel Performance

7. How do repeat orders affect performance by source?

Is_Repeat_Order: Yes

No	Yes
----	-----

Channel Sources vs KPIs						
utm_source	Total Sessions	Bounce Rate %	AOV	Conversion Rate %	Gross Profit %	Sessions per User
bsearch	41		68.08	100.00	61.37	1.00
gsearch	170		60.13	100.00	59.48	1.00

Is_Repeat_Order: No

No	Yes
----	-----

Channel Sources vs KPIs						
utm_source	Total Sessions	Bounce Rate %	AOV	Conversion Rate %	Gross Profit %	Sessions per User
bsearch	4478		59.37	100.00	58.36	1.00
gsearch	21163		59.82	100.00	58.22	1.00
socialbook	343		64.90	100.00	58.72	1.00

Observations:

- Repeat orders show 100% conversion across channels (expected, but highlights consistency).
- AOV is better for repeat orders than first-time orders.
- Repeat traffic volume is low but highly efficient.

Recommendations:

- Invest in retention strategies to encourage second and third purchases.
- Send reminders or special offers post-first purchase to boost reorders.
- Analyze delay between first and repeat purchases to optimize email timing.



Marketing Channel Performance

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6. Which channel generates better profit margins?
7. How do repeat orders affect performance by source?

- **gsearch**
- **gsearch**
- **brand (bsearch)**
- **desktop better**
- **socialbook**
 - **all similar (~ 59%)**
 - **socialbook (no repeat order)**





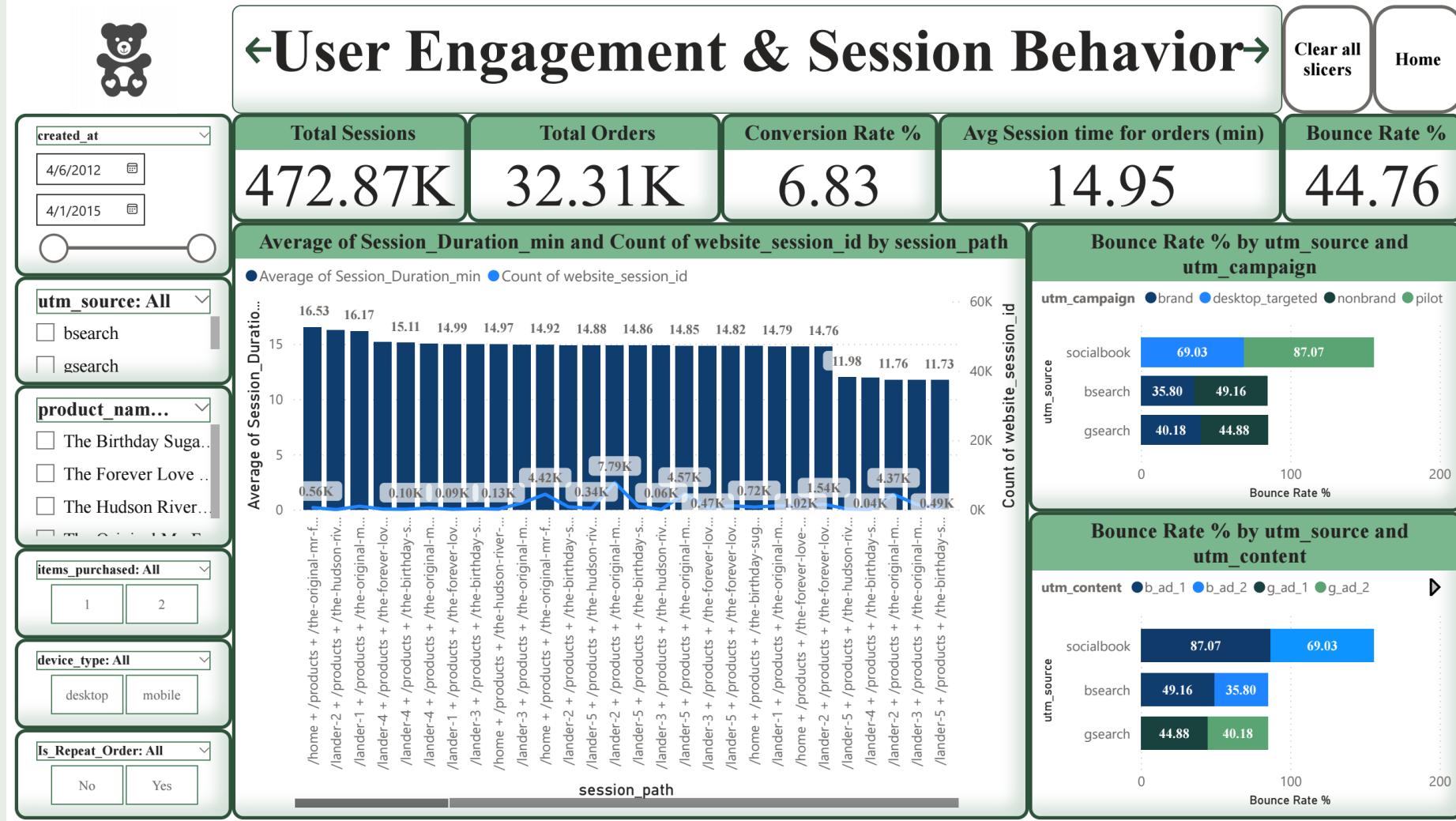
User Engagement & Session Behavior

1. Which session paths result in longer user engagement?
2. Which campaigns or creatives cause higher bounce rates?
3. What is the average session time for buyers?
4. Which traffic sources have the most engaged users?
5. Are users dropping off more on specific devices?
6. Are returning visitors more engaged than first-timers?





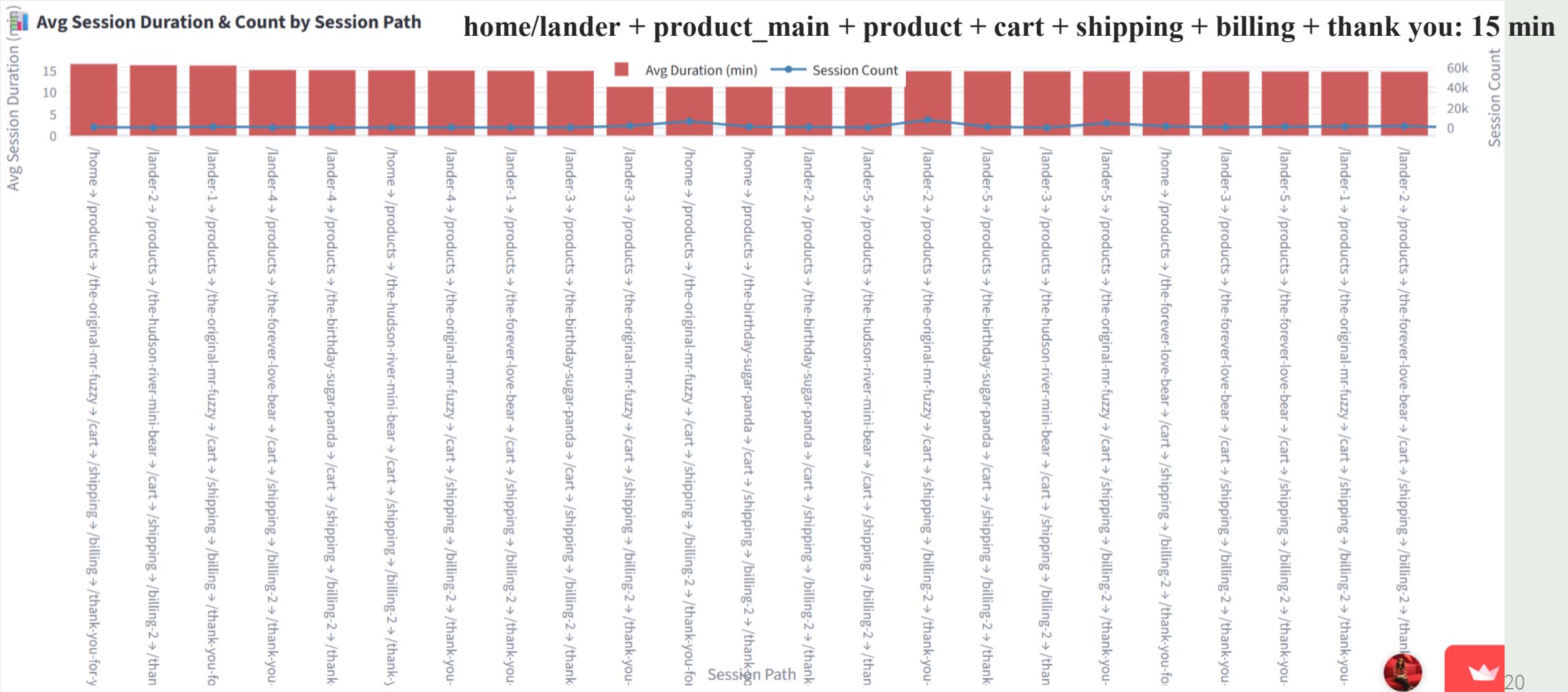
User Engagement & Session Behavior





User Engagement & Session Behavior

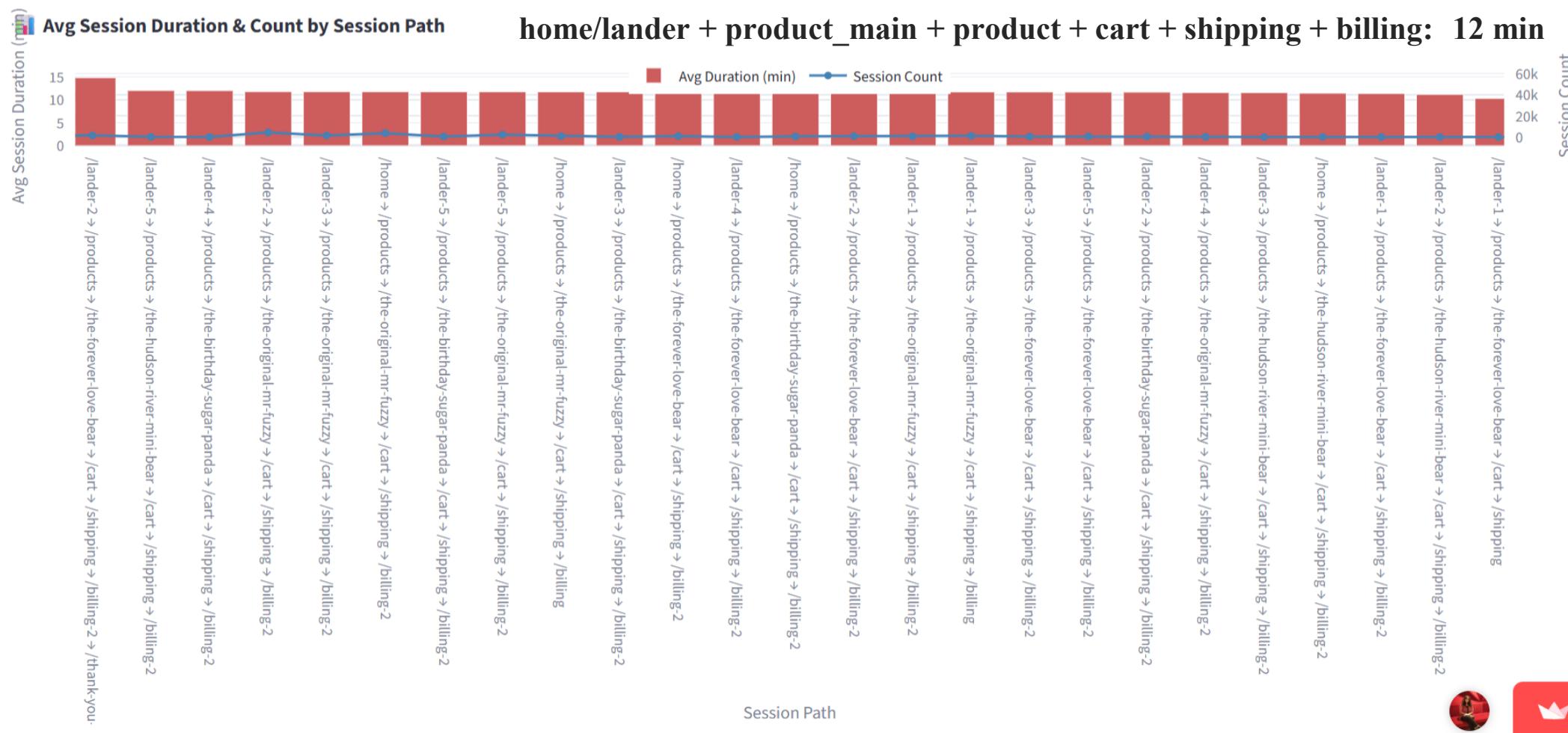
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User Engagement & Session Behavior

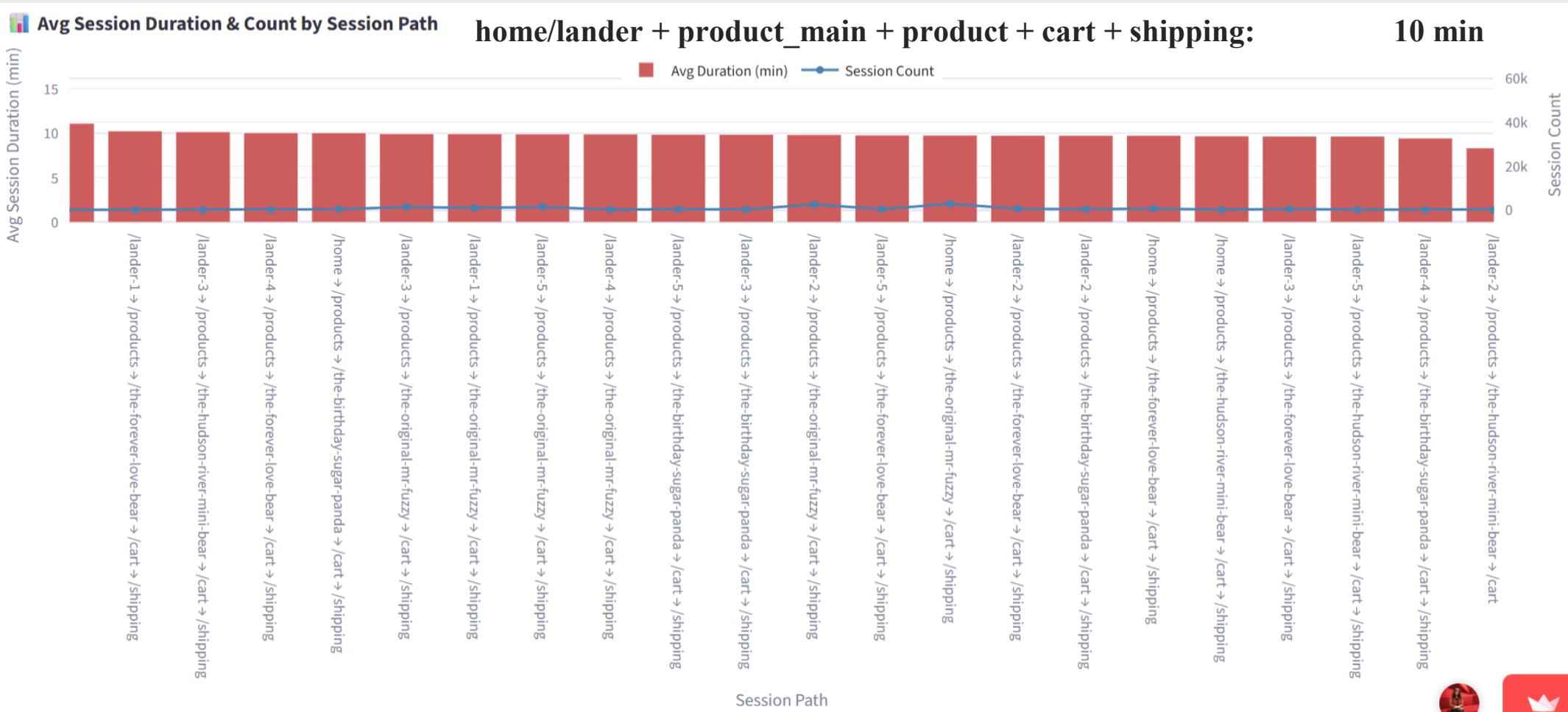
1. Which session paths result in longer user engagement?





User Engagement & Session Behavior

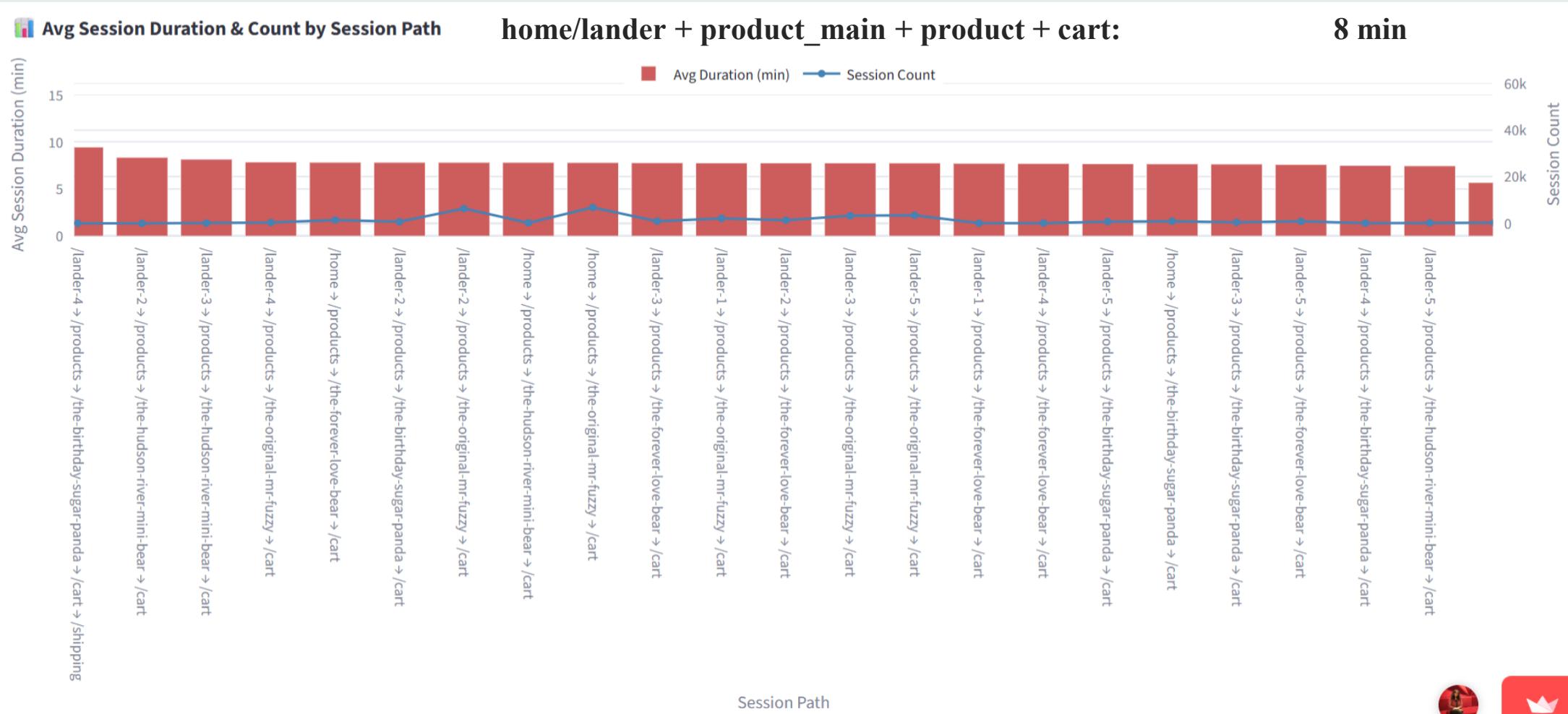
1. Which session paths result in longer user engagement?





User Engagement & Session Behavior

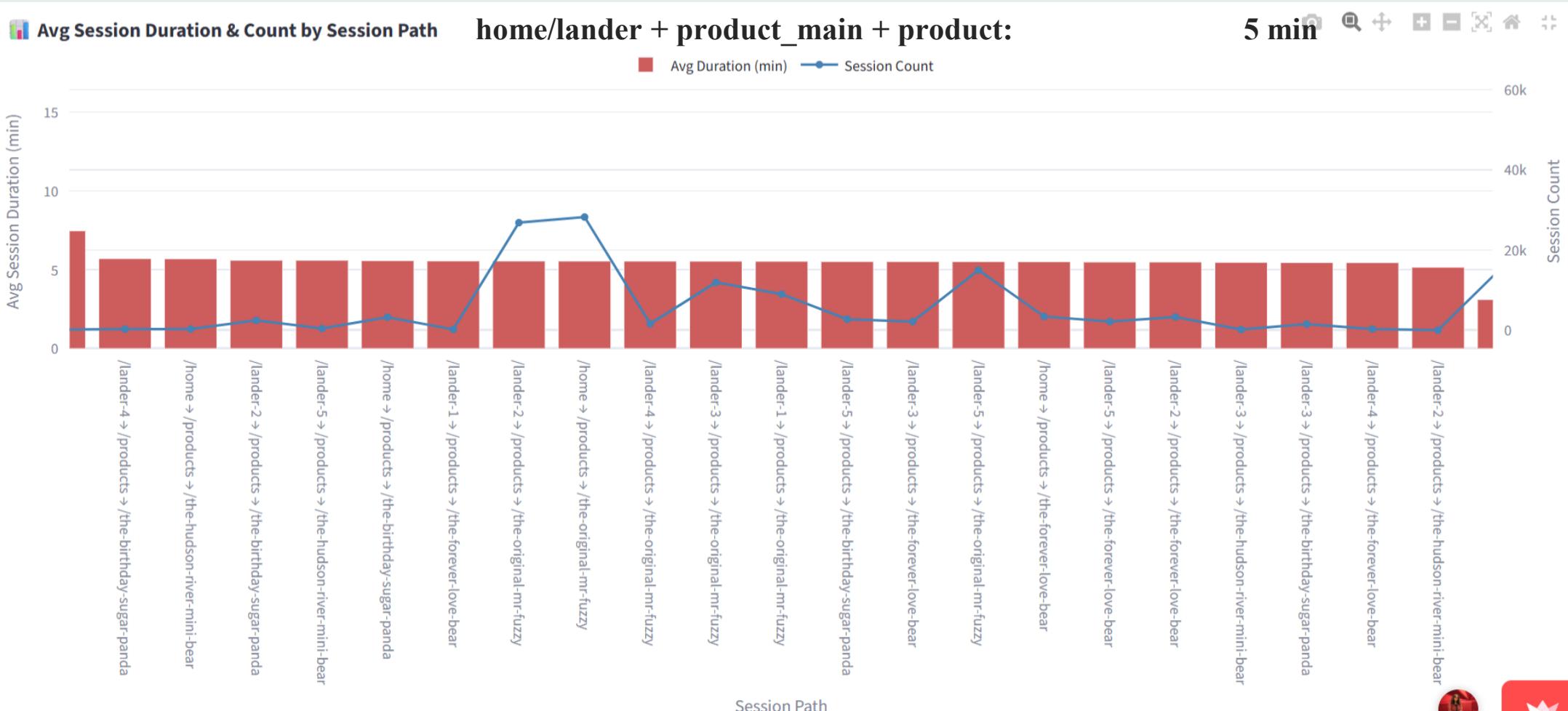
1. Which session paths result in longer user engagement?





User Engagement & Session Behavior

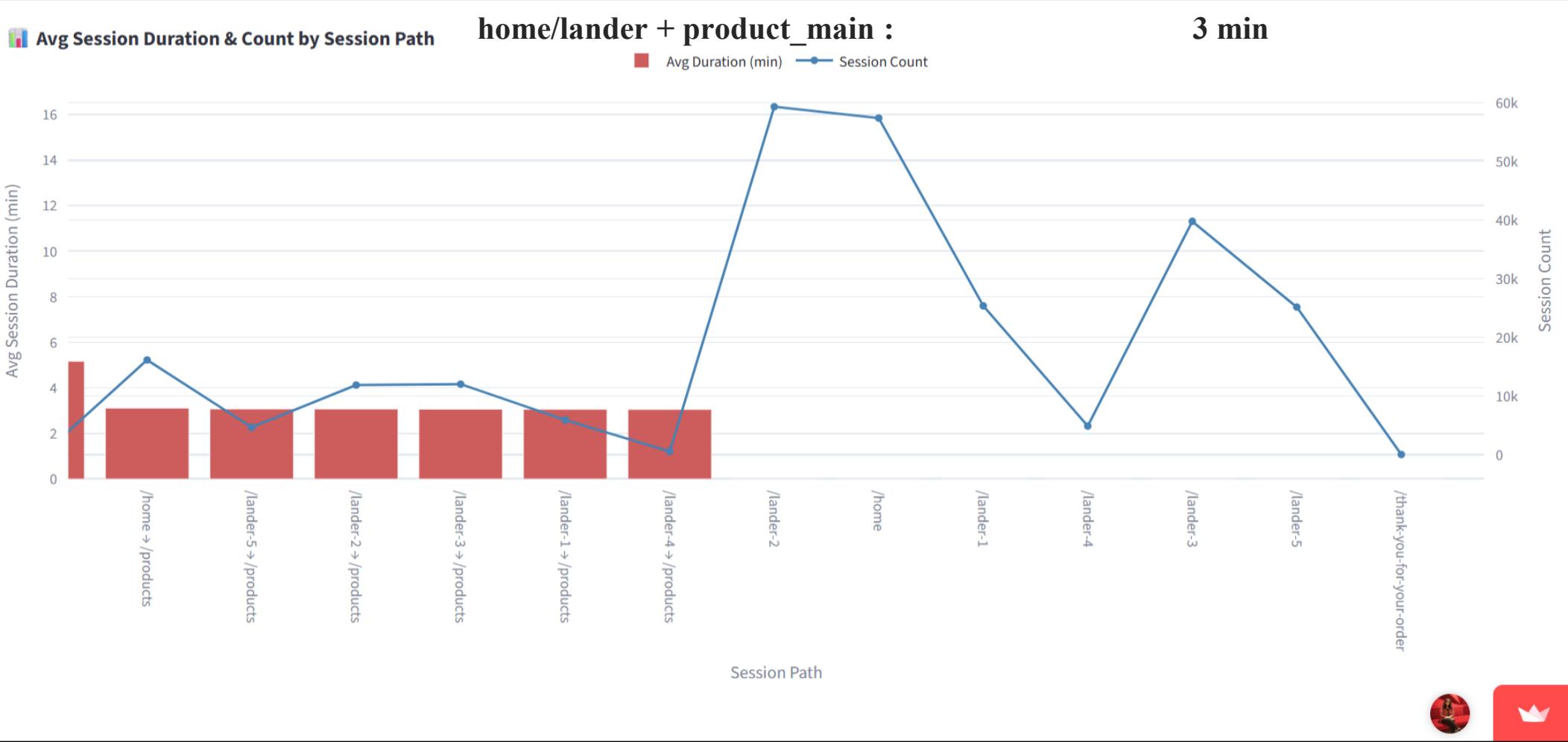
1. Which session paths result in longer user engagement?





User Engagement & Session Behavior

1. Which session paths result in longer user engagement?

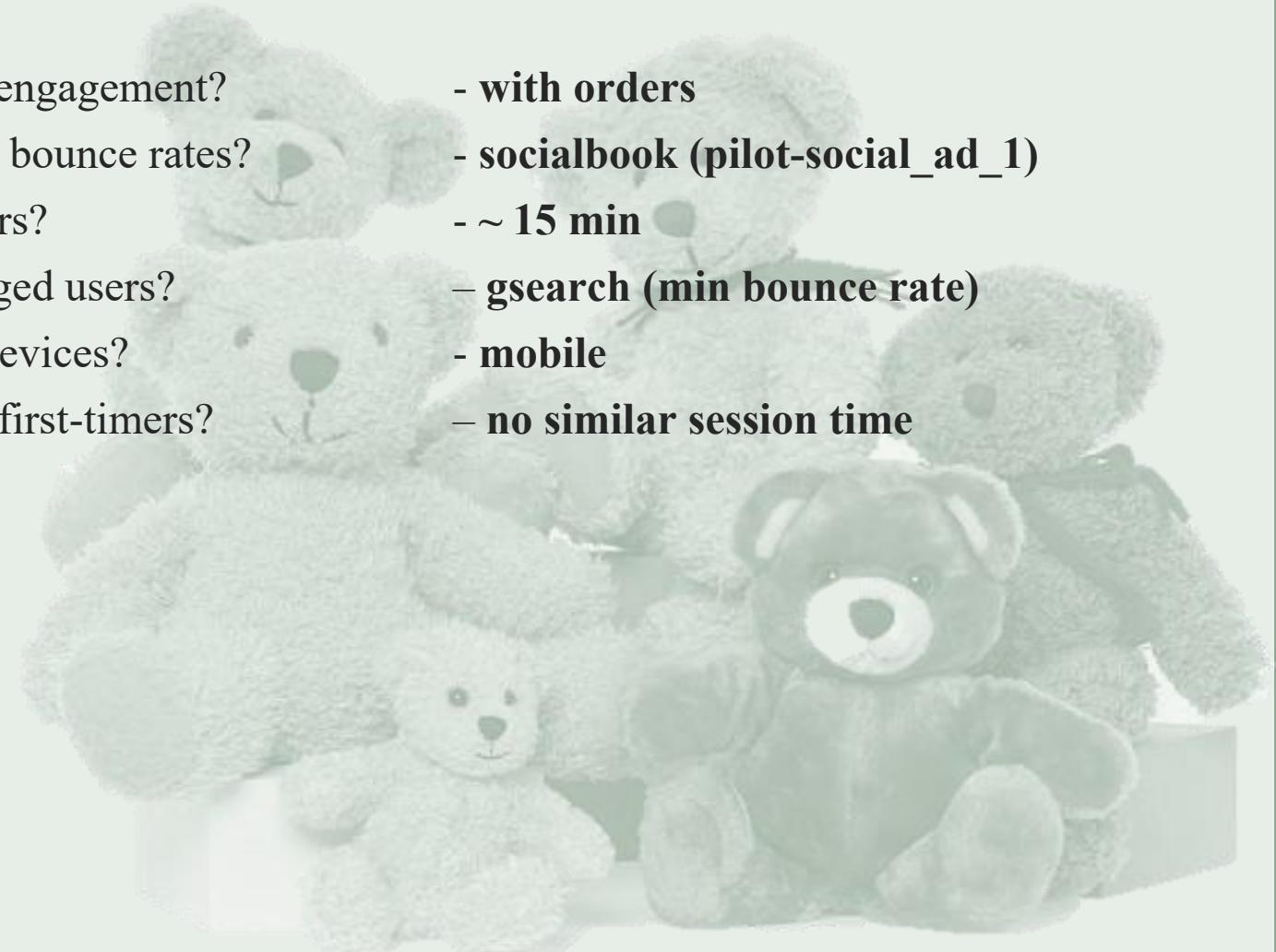




User Engagement & Session Behavior

1. Which session paths result in longer user engagement?
2. Which campaigns or content cause higher bounce rates?
3. What is the average session time for buyers?
4. Which traffic sources have the most engaged users?
5. Are users dropping off more on specific devices?
6. Are returning visitors more engaged than first-timers?

- **with orders**
- **socialbook (pilot-social_ad_1)**
- **~ 15 min**
- **gsearch (min bounce rate)**
- **mobile**
- **no similar session time**





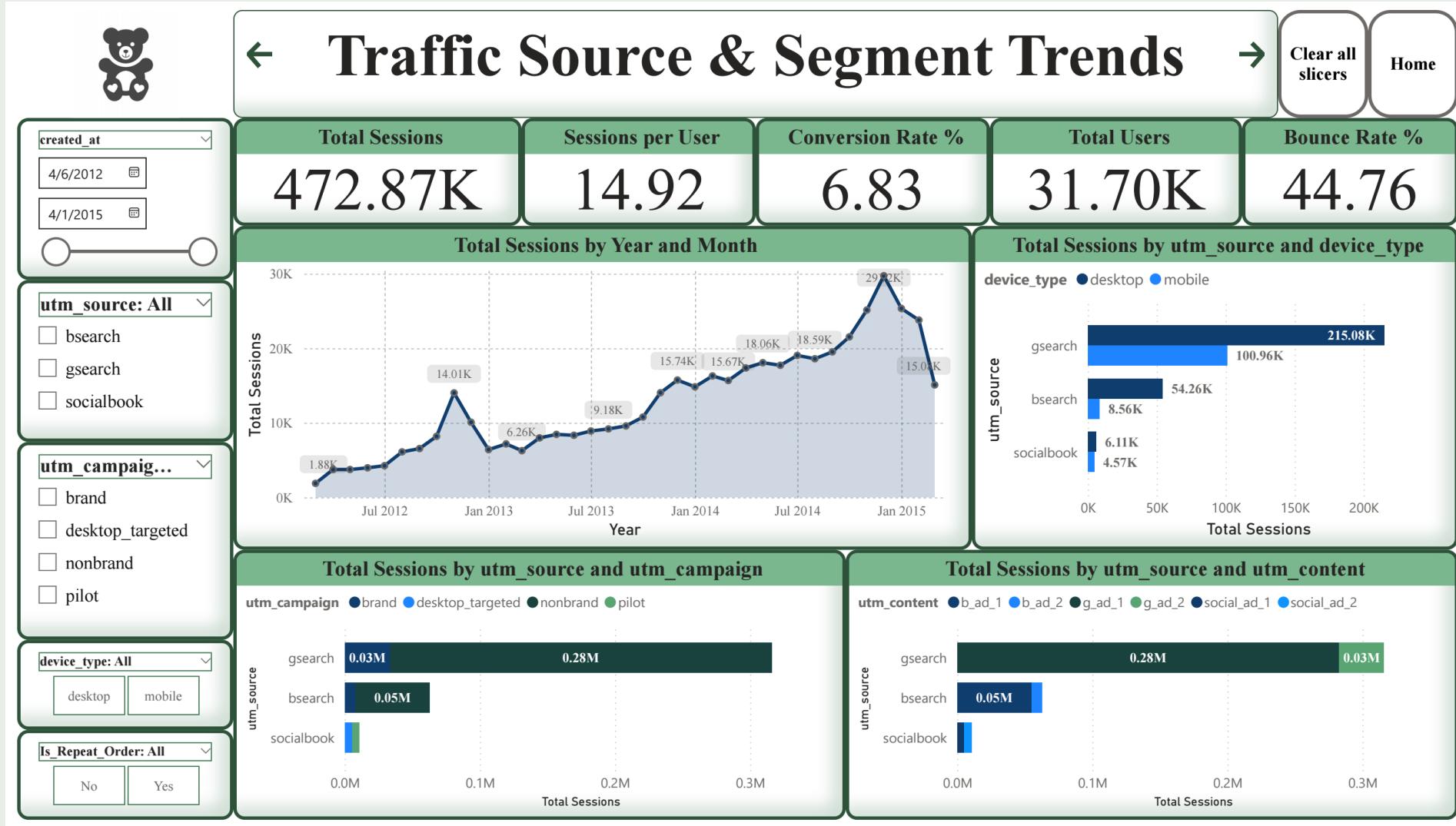
Traffic Source & Segment Trends

1. Which channels show seasonal increases in traffic?
2. How is traffic distributed across devices?
3. Which utm_campaigns perform best by volume?
4. Which utm_content variations attract more users?
5. Are mobile or desktop users more active?
6. Is repeat traffic more prominent on certain channels?
7. Which segments show growth over time?





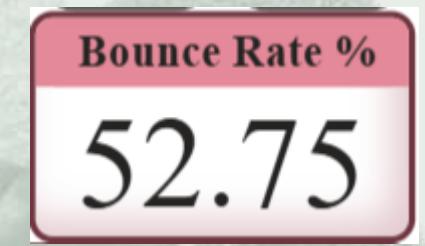
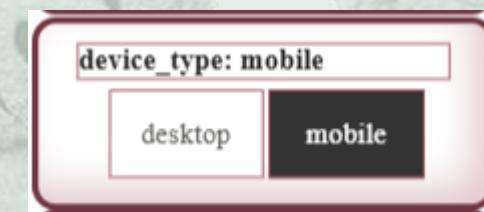
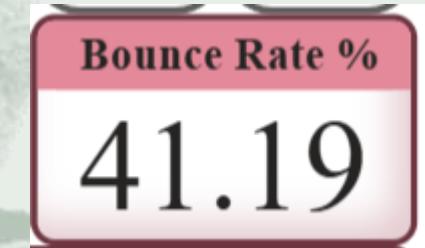
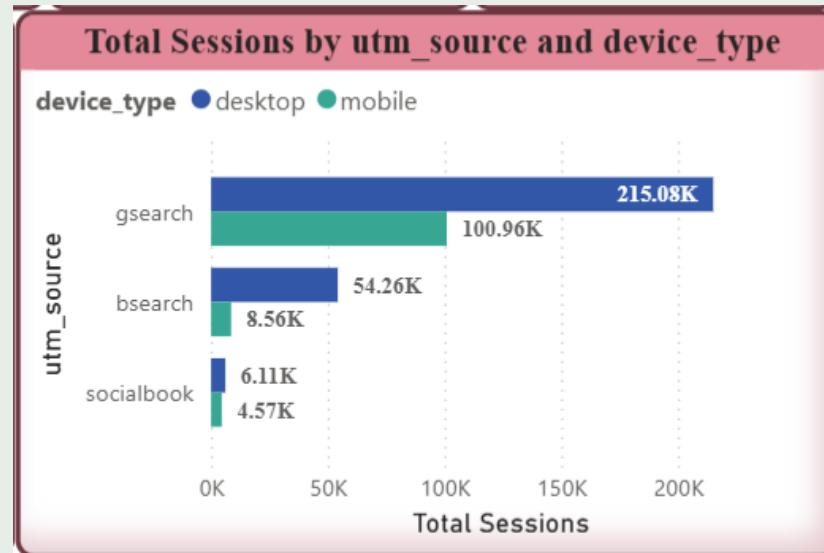
Traffic Source & Segment Trends





Traffic Source & Segment Trends

5. Are mobile or desktop users more active?



Observations:

- Mobile users have a higher bounce rate (52.75%) compared to desktop (41.19%).
- gsearch has strong mobile and desktop performance, but bsearch is weaker on mobile.
- Desktop users are more engaged with higher conversion and performance metrics.

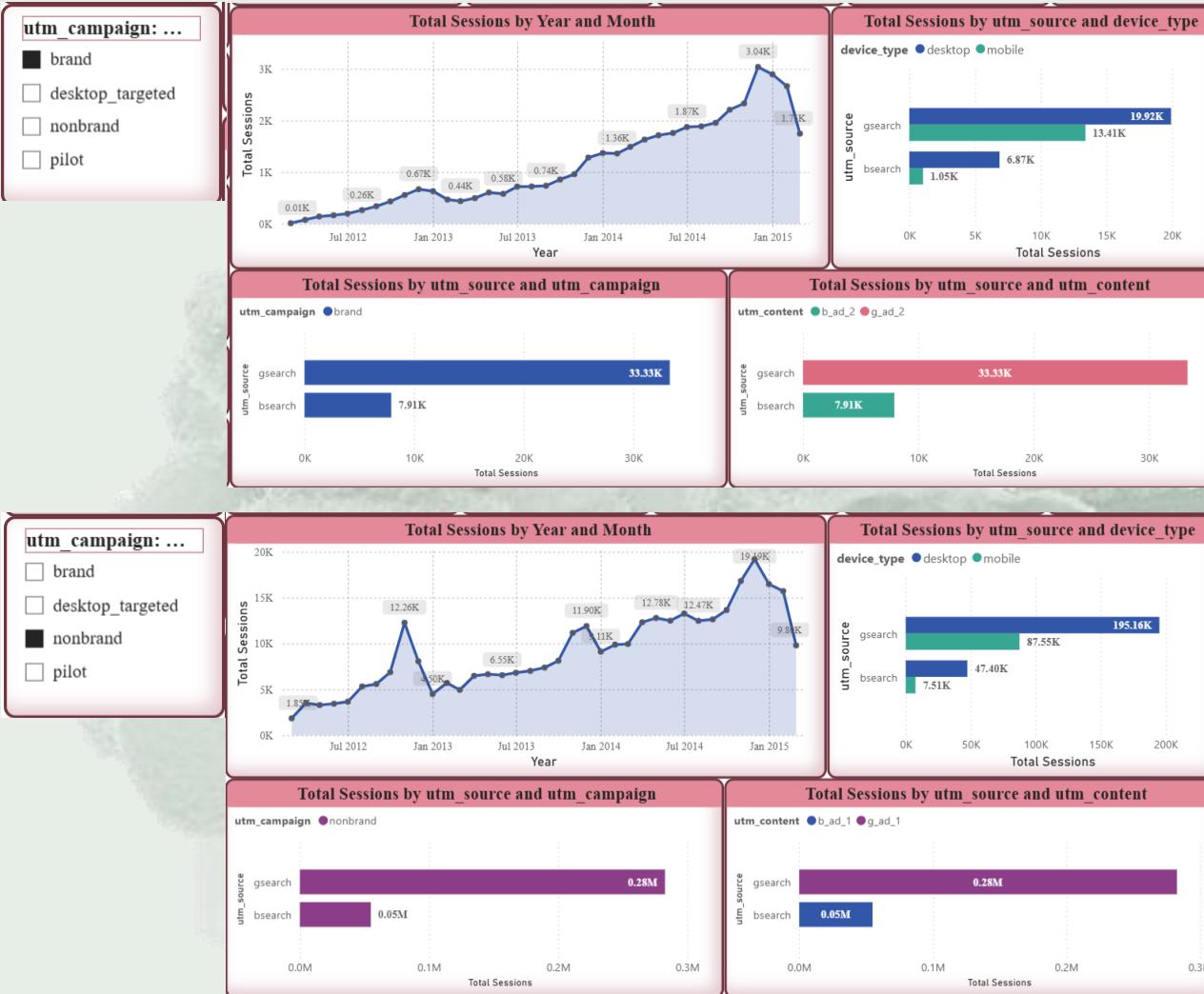
Recommendations:

- Improve mobile UX/UI for smoother navigation and faster load times.
- Focus on optimizing mobile acquisition campaigns from bsearch.
- Encourage app downloads to enhance mobile experience.



Traffic Source & Segment Trends

7. Which segments show growth over time?



Observations:

- gsearch and brand campaigns are driving consistent growth over time.
- desktop-targeted campaigns show strong session and conversion performance.
- pilot and nonbrand campaigns are underutilized but show some spikes.

Recommendations:

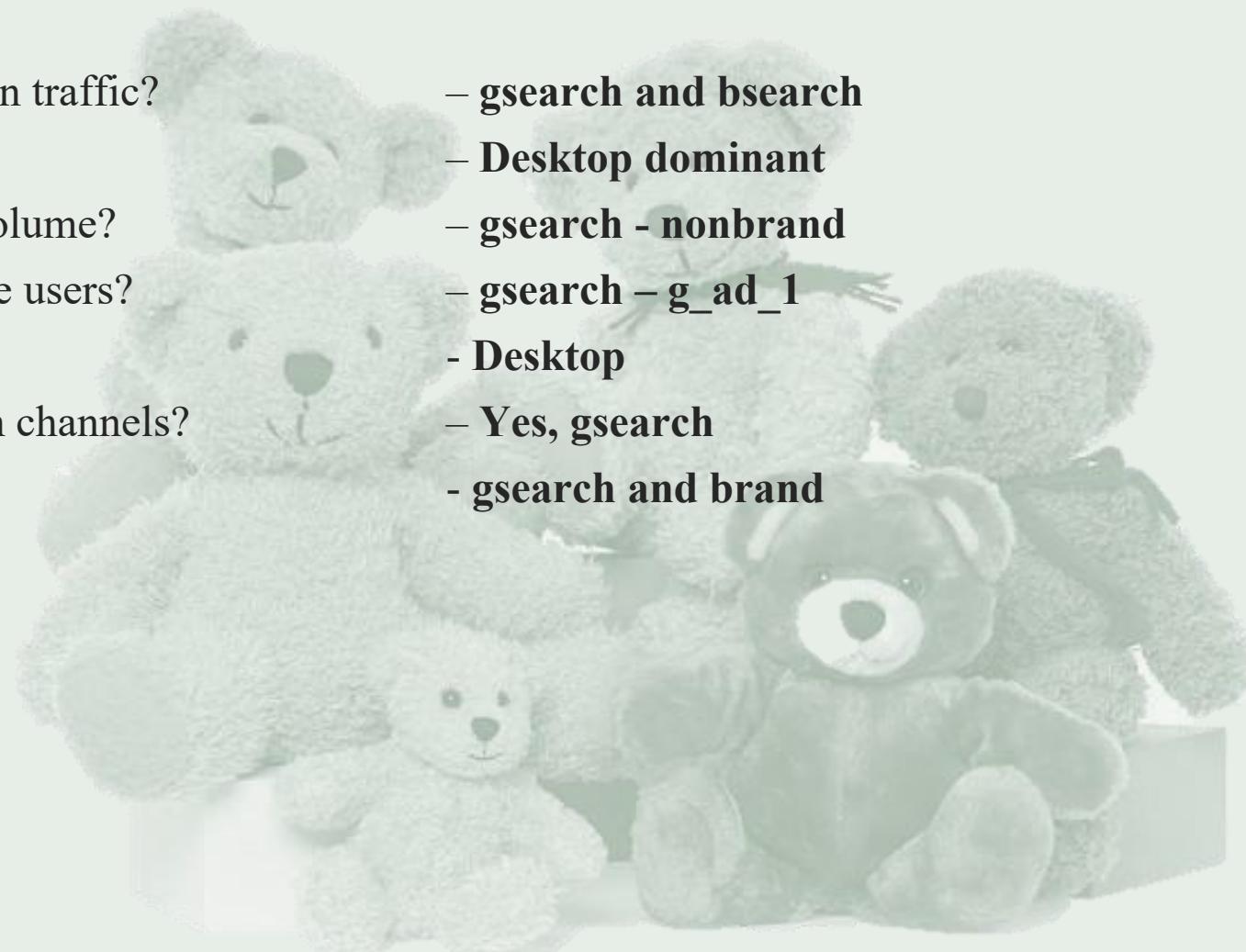
- Double down on successful brand and gsearch campaigns.
- Test expanding pilot/nonbrand campaigns with refined audience targeting.
- Use device and campaign segmentation for personalized marketing.



Traffic Source & Segment Trends

1. Which channels show seasonal increases in traffic?
2. How is traffic distributed across devices?
3. Which utm_campaigns perform best by volume?
4. Which utm_content variations attract more users?
5. Are mobile or desktop users more active?
6. Is repeat traffic more prominent on certain channels?
7. Which segments show growth over time?

- **gsearch and bsearch**
- **Desktop dominant**
- **gsearch - nonbrand**
- **gsearch – g_ad_1**
- **Desktop**
- **Yes, gsearch**
- **gsearch and brand**





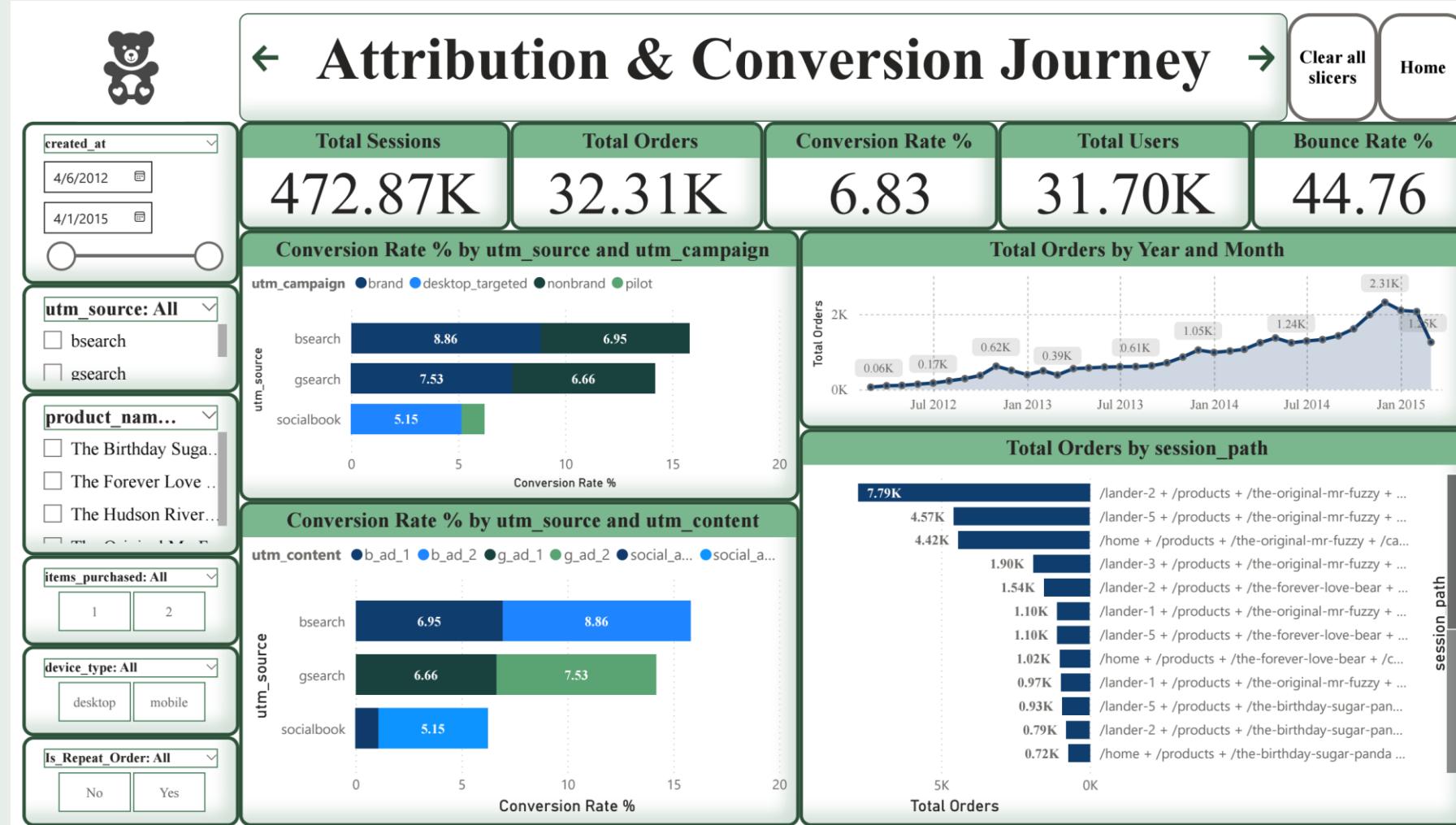
Attribution & Conversion Journey

1. What is the most common conversion path?
2. Which sources and campaigns drive the highest conversions?
3. Which content types contribute to conversions?
4. Which products convert better by path?
5. What's the role of repeat users in conversions?





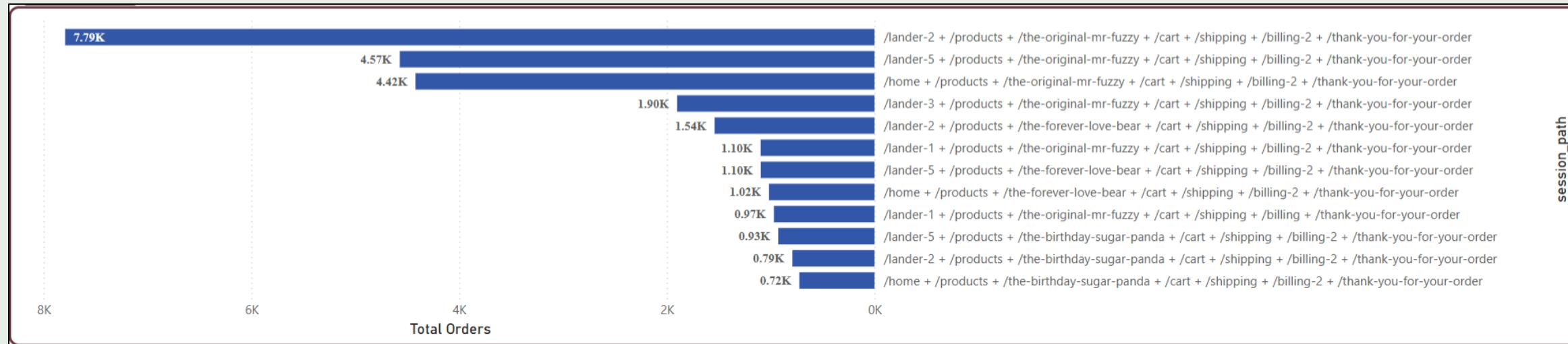
Attribution & Conversion Journey





Attribution & Conversion Journey

1. What is the most common conversion path?



Observations:

- Highly Concentrated Path: The top path `/lander-2 → /products → /the-original-mr-fuzzy → /cart → /shipping → /billing-2 → /thank-you-for-your-order` accounts for 7.79K orders, significantly more than any other path.
- Product Focus: The Original Mr. Fuzzy is a recurring product in almost all top conversion paths, indicating its strong role in driving purchases.
- Consistent Checkout Flow: Most successful paths follow a structured funnel: landing page → product → cart → shipping → billing → thank-you, showing that users follow a predictable route when converting.

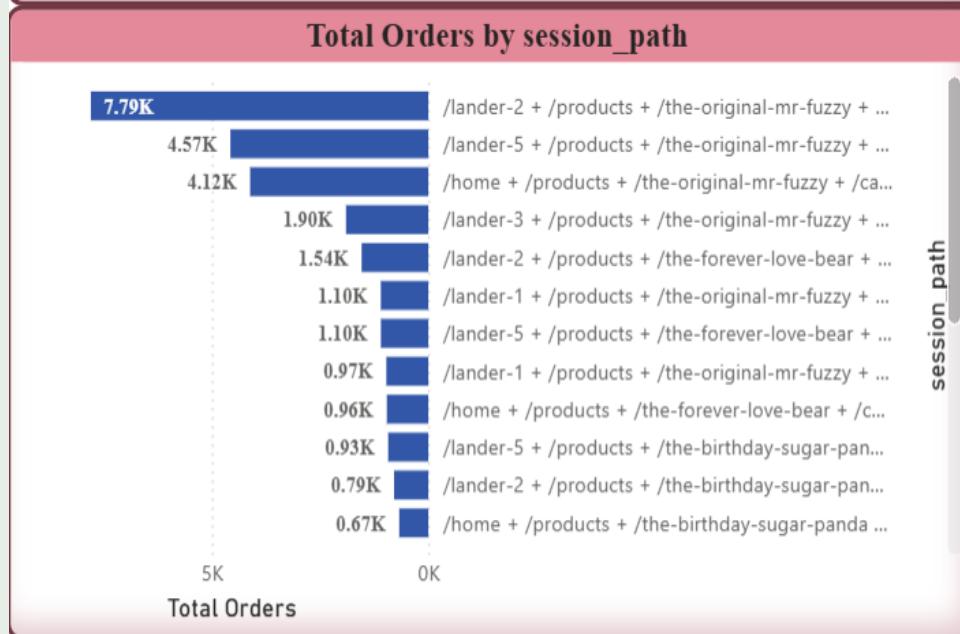
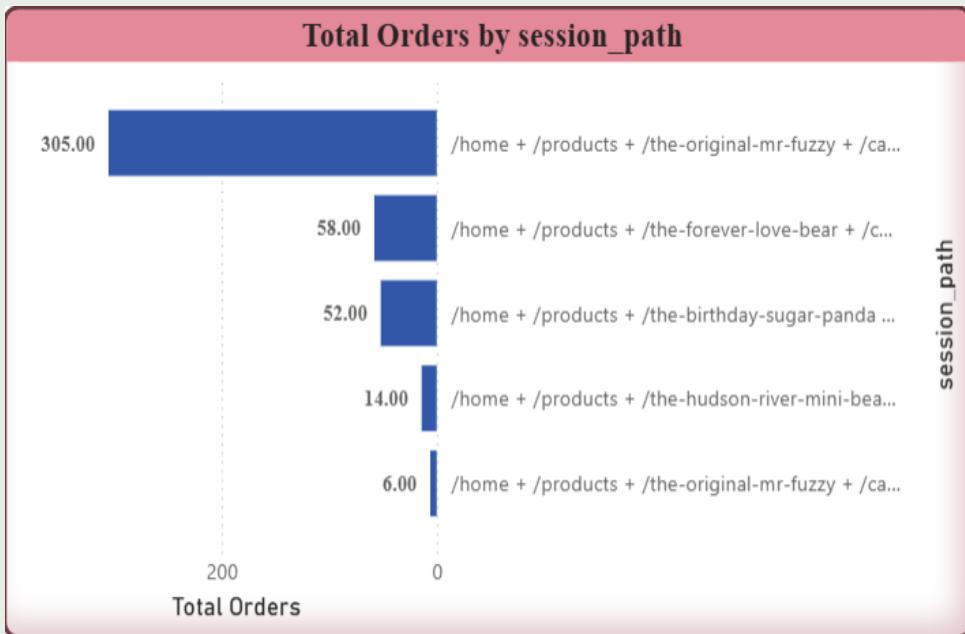
Recommendations:

- Optimize Top Path: Ensure that `/lander-2`, The Original Mr. Fuzzy product page, and associated checkout steps are fully optimized for load speed, mobile responsiveness, and clear CTAs since they handle a large portion of conversions.
- Replicate Top Funnel: Use the structure of the highest-converting path to guide UX for other products—especially The Forever Love Bear and The Birthday Sugar Panda—to increase their conversion efficiency.
- Personalize or Test Landers: Since `/lander-2` and `/lander-5` perform well, experiment with A/B testing alternative landing pages or personalization strategies to boost performance for other user segments or campaigns.



Attribution & Conversion Journey

5. What's the role of repeat users in conversions?



Observations:

- Repeat users drive higher order volume through direct product paths.
- Repeat users show more focused navigation indicating loyalty.

Recommendations:

- Build loyalty programs or retargeting campaigns to increase repeat visits.
- Customize messaging based on visit history.



Attribution & Conversion Journey

1. What is the most common conversion path?
 - **path /lander-2 → /products → /the-original-mr-fuzzy → /cart → /shipping → /billing-2 → /thank-you-for-your-order**
2. Which sources and campaigns drive the highest conversions?
 - **bsearch - brand**
3. Which content types contribute to conversions?
 - **bsearch – b_ad_2**
4. Which products convert better by path?
 - **The Original Mr. Fuzzy**
5. What's the role of repeat users in conversions?
 - **Loyal base**





Product Performance

1. Which product generates the most revenue?
2. Which product has the highest refund rate?
3. What are the most popular product combos?





Product Performance



Product Performance

Clear all
slicers

Home

6.83

Conversion Rate %

1.94M

Gross Revenue

40.03K

Total Units Sold

32.31K

Total Orders

1.22M

Total Margin

4.40

Refund Rate %

created_at

4/6/2012

4/1/2015

utm_source

All

device_type: All

desktop

mobile

Is_Repeat_Order: All

No

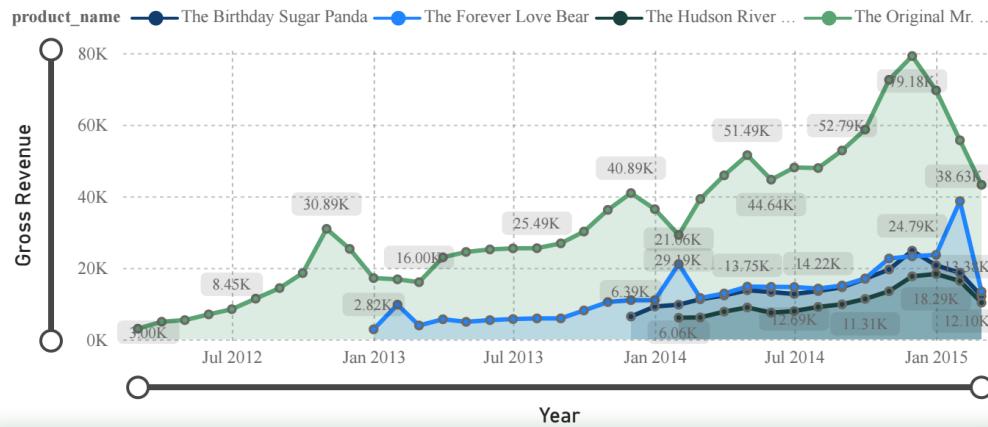
Yes

Is_Returned: All

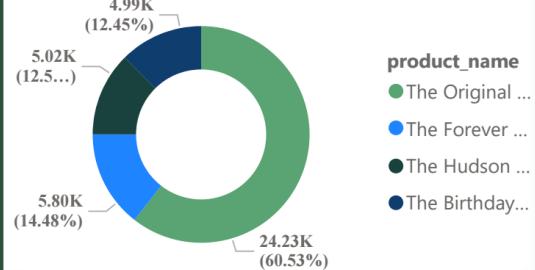
No

Yes

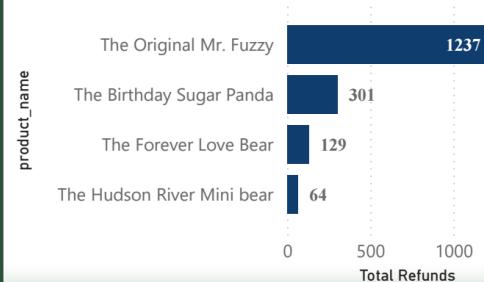
Gross Revenue and Total Orders by Year, Month and product_name



Total Units Sold by product_name



Total Refunds by product_name



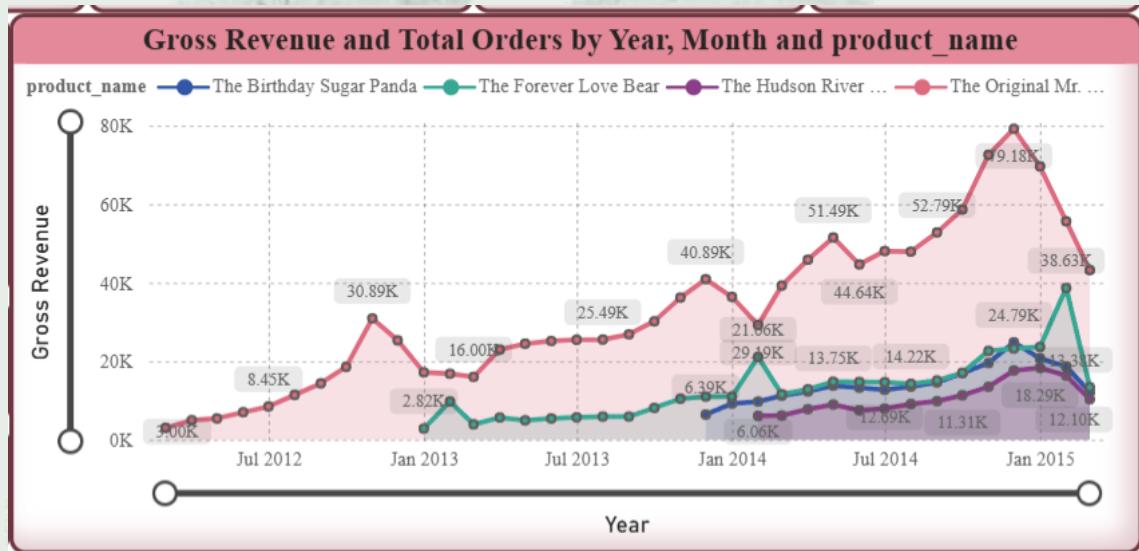
Cross-Selling Product Metrics (Orders count)

product_name	The Birthday Sugar Panda	The Forever Love Bear	The Hudson River Mini bear
The Original Mr. Fuzzy	2036	944	3142
The Forever Love Bear		248	680
The Birthday Sugar Panda			662



Product Performance

1. Which product generates the most revenue?



Observations:

- The Original Mr. Fuzzy consistently outperforms other products in revenue.
- Revenue growth for this product is strong and stable across months.
- Other products show relatively flat trends, indicating a narrow product revenue concentration.

Recommendations:

- Prioritize The Original Mr. Fuzzy in marketing campaigns.
- Use insights from this product's success to guide development of similar products.



Product Performance

3. What are the most popular product combos?

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The Forever Love Bear	248		680
The Birthday Sugar Panda			662

Observations:

- Top product combinations frequently include The Hudson River Mini Bear and The Original Mr. Fuzzy.
- Some product pairings outperform individual sales.
- Cross-selling potential is visible in many top combinations.

Recommendations:

- Promote bundled offers featuring high-performing combos.
- Highlight product pairings during checkout or in remarketing ads.



Product Performance

1. Which product generates the most revenue?
2. Which product has the highest refund rate?
3. What are the most popular product combos?

- The Original Mr. Fuzzy**
- **The Birthday Sugar Panda**
- The Hudson River Mini Bear and The Original Mr. Fuzzy.**



Thank you

Deepika Dohare



3. What are the most popular product combos?

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