Google Analytics & A/B testing

Dr. Adina Aldea

Outline

- **Google analytics**
  - What is it and why should you use it?
  - What kind of metrics can you use?
  - How does it work?
- **A/B testing**
  - What is it and why should you use it?
  - How does Google Optimize work?
- **Other useful Google tools**
- **Google Analytics mini assignment**

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GOOGLE ANALYTICS

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What are Web Analytics?

- Approach that involves collecting, measuring, monitoring, analyzing and reporting web usage data to understand visitor's experience

- Can help optimize web sites
  - To accomplish business goals
  - To improve customer satisfaction and loyalty

- Can collect web data from:
  - Server-based log-files (limited and sometimes inaccurate)
  - Client-based page-tagging

- Also known as Digital analytics

Hasan, L., Morris, A., & Probets, S. (2009, July). Using Google Analytics to evaluate the usability of e-commerce sites. In International Conference on Human Centered Design (pp. 697-706). Springer, Berlin, Heidelberg.

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Which Web Analytics tools can be used?

Web analytics tool	Subscription charges (USD)	Best feature
Google Analytics	Free (Standard), $150,000 Annual (Premium)	Integration with google products
Spring Metrics	$49 per month	Simplicity
Woopra	$0 - $1999 plans	Desktop application
Clicky	Free	Mobile version
Mint	$30 per website	Real time stats
Chartbeat	$0 - $9.95 per month	Real time stats
Kissmetrics	$149 per month	Timeline view
User Testing	$39 per user	Detailed analysis of users
Crazy Egg	$9 per month	Uses heatmap technology
Mouseflow	$13 per month	Video analysis of user actions

Table 1 - Comparison of web analytics services

Image source: Chande, S. (2015) - Google Analytics-Case study.

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Why should you use Google Analytics?

- It's free!

- Integration with other Google tools (e.g.: Ads, AdSense, Optimize, BigQuery, etc.)

- Provides insight into the behavior of visitors coming to your website based on real-time tracking

- Customizable reports, metrics, dimensions, goals, etc.

- Great documentation and support

Image source:
https://www.logit.net/blog/10-reasons-why-you-should-choose-google-analytics/

Google Analytics free e-commerce dataset

- Data from the Google Merchandise store

- Includes the following kinds of information:
  - **Traffic source data:** Information about where website users originate. This includes information about organic traffic, paid search traffic, and display traffic.
  - **Content data:** Information about the behavior of users on the site. This includes the URLs of pages that users look at, and how they interact with page content.
  - **Transaction data:** Information about the transactions that occur on the Google Merchandise Store website.

- More information on how to access this dataset at: https://support.google.com/analytics/answer/6367342?hl=en

- Google Analytics free online courses https://analytics.google.com/analytics/academy/

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General Data Protection Regulation - GDPR

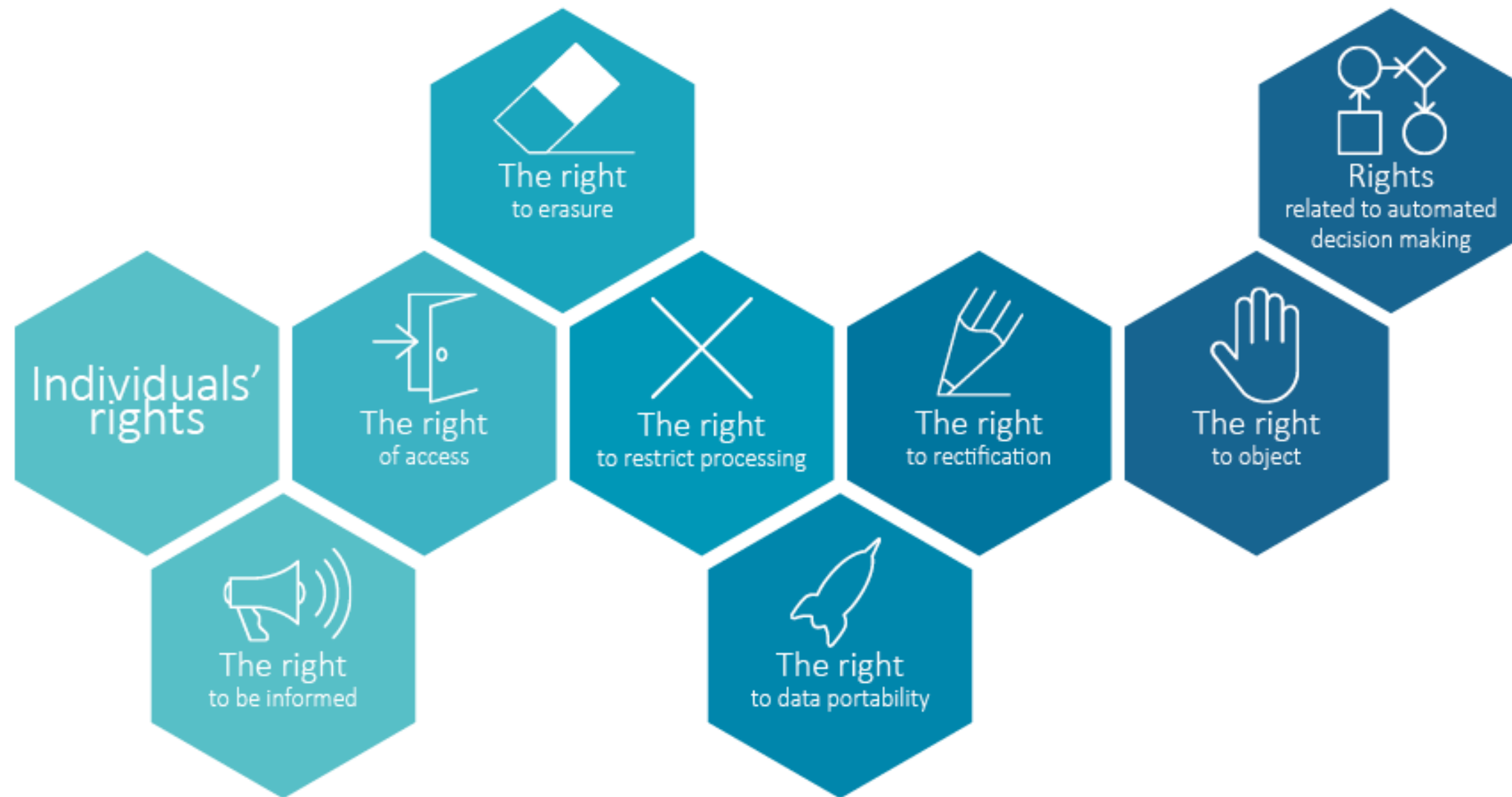Image source: https://hackernoon.com/how-to-make-your-product-gdpr-compliant-396a6c0336c2

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GDPR and Google Analytics

- Google has added several features to help with GDPR compliance

- Ability to delete the information of individual users if they request it

- Data retention settings which allow you to control how long individual user data is saved before being automatically deleted
  - 26 months as default setting
  - only applies to data about individual users and events, so aggregate data about high-level information like page views won't be impacted by this

- Ability to anonymize IP address before it is stored (via Google Tag Manager)

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GDPR – Cookie policy notification on website

This website uses cookies

We use cookies to personalize content and ads, to provide social media features and to analyze our traffic. We also share information about your use of our site with our social media, advertising and analytics partners who may combine it with other information that you've provided to them or that they've collected from your use of their services. You consent to our cookies if you continue to use our website.

☑ Necessary   ✔ Preferences   ✔ Statistics   ☐ Marketing   Show details ⌄   OK

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What are dimensions and metrics?

- Dimensions
  - The attributes of the visitors coming to your website
  - E.g.: Gender, Age, City, Source/Medium, Browser, Operating system, etc.

- Metrics
  - Ways to measure the characteristics of the dimensions
  - Examples for the Source/Medium dimension: Sessions, % New sessions, Bounce rate, Average session duration, Goal completions

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What type of metrics are available?

- **Real-time** (data updates continuously and is reported within seconds)
- **Audience** (users, sessions, pageviews, bounce rate, etc.)
- **Acquisition** (source of visitor traffic)
- **Behavior** (flow of visitors through website, pages viewed, site speed, etc.)
- **Conversions** (goals, measures for e-commerce, etc.)

Search reports and help

Home

Customization

REPORTS

Real-Time

Audience

Acquisition

Behavior

Conversions

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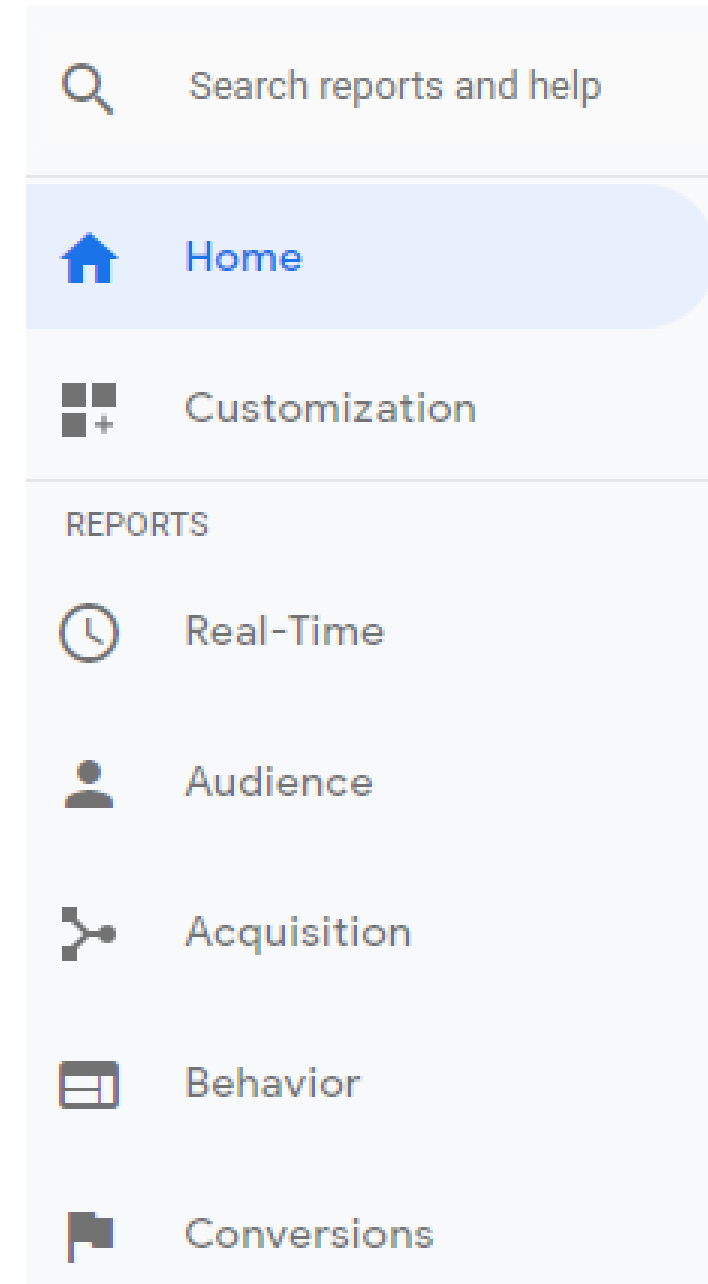
Real-time metrics

- Data updates continuously and is reported within seconds of visitor action
  - the number of people on your site right now
  - their geographic locations
  - the keywords and sites that referred them
  - which pages they're viewing
  - conversions as they happen

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Real-time metrics - Overview

Right now

13

active users on site

■ DESKTOP ■ MOBILE

DESKTOP	MOBILE
69%	31%

Pageviews

Per minute | Per second

Top Referrals:

Source	Active Users ↓
1. mall.googleplex.com	2

Top Social Traffic:

Source	Active Users ↓
There is no data for this view.	

Top Keywords:

Keyword	Active Users ↓
1. (not provided)	4
2. https://mall.googleplex.c...?hash=[REDACTED PASSWORD]	1

Top Active Pages:

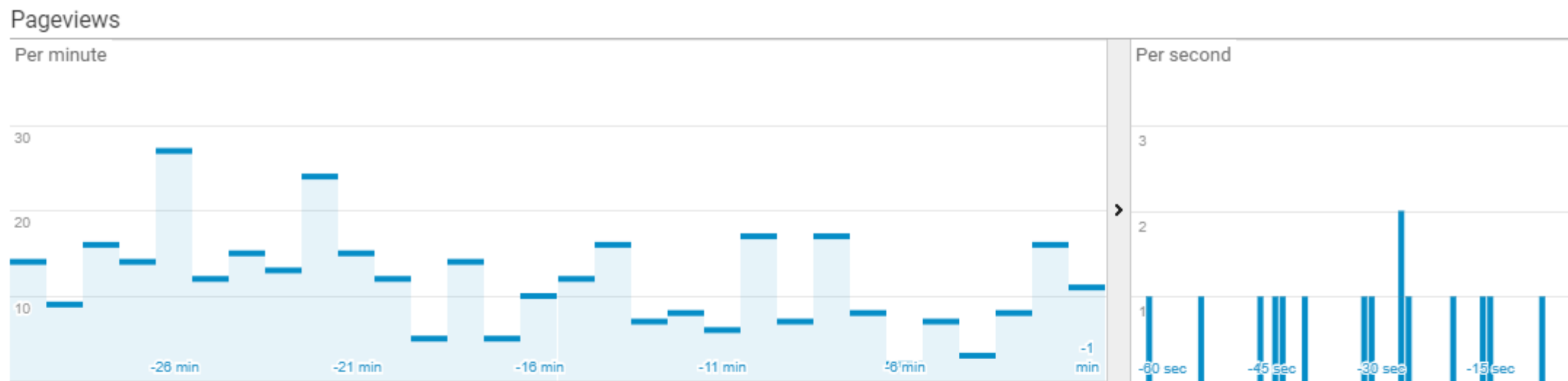|	Active Page	Active Users	↓
1.	/Google+Redesign/Clearance	2	15.38%
2.	/Google+Redesign/Nest/Nest-usa	2	15.38%
3.	/home	2	15.38%
4.	/Google+Redesign/Apparel/Google+Tee+Blue	1	7.69%
5.	/Google+Redesign/Apparel/Headgear	1	7.69%
6.	/Google+Redesign/Apparel/quickview	1	7.69%
7.	/asearch.html?keyword=backpack	1	7.69%
8.	/asearch.html?keyword=nest	1	7.69%
9.	/ordercompleted.html?orderDataId=91661	1	7.69%
10.	/payment.html?securitytoken=[REDACTED PASSWORD]	1	7.69%

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Real-time metrics - Overview

Right now

13

Referral

Link that sent the visitors to the website, probably from an e-mail marketing campaign

Top Referrals:

Source	Active Users ↓
1. mall.googleplex.com	2

Top Social Traffic:

Source	Active Users ↓
There is no data for this view.	

Top Keywords:

Keyword	Active Users ↓
1. (not provided)	4
2. https://mall.googleplex.c...?hash=[REDACTED PASSWORD]	1

Pageviews

Per minute

Per second

Top Active Pages:

	Active Page	Active Users	↓
1.	/Google+Redesign/Clearance	2	15.38%
2.	/Google+Redesign/Nest/Nest-usa	2	15.38%
3.	/home	2	15.38%
4.	/Google+Redesign/Apparel/Google+Tee+Blue	1	7.69%
5.	/Google+Redesign/Apparel/Headgear	1	7.69%
6.	/Google+Redesign/Apparel/quickview	1	7.69%
7.	/asearch.html?keyword=backpack	1	7.69%
8.	/asearch.html?keyword=nest	1	7.69%
9.	/ordercompleted.html?orderDataId=91661	1	7.69%
10.	/payment.html?securitytoken=[REDACTED PASSWORD]	1	7.69%

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Real-time metrics - Overview

Right now

13

active users on site

■ DESKTOP ■ MOBILE

| 69% | 31% |

Keywords

Keywords used to find your website. Google Search Console provides a more detailed overview

Top Referrals

	Source	sers ↓
1.	mall.google	2

Top Social Traffic:

	Source	Active Users ↓
	There is no data for this view.	

Top Keywords:

	Keyword	Active Users ↓
1.	(not provided)	4
2.	https://mall.googleplex.c...?hash=[REDACTED PASSWORD]	1

Pageviews

Per minute

Per second

Top Active Pages:

	Active Page		Active Users ↓
1.	/Google+Redesign/Clearance	2	15.38%
2.	/Google+Redesign/Nest/Nest-usa	2	15.38%
3.	/home	2	15.38%
4.	/Google+Redesign/Apparel/Google+Tee+Blue	1	7.69%
5.	/Google+Redesign/Apparel/Headgear	1	7.69%
6.	/Google+Redesign/Apparel/quickview	1	7.69%
7.	/asearch.html?keyword=backpack	1	7.69%
8.	/asearch.html?keyword=nest	1	7.69%
9.	/ordercompleted.html?orderDataId=91661	1	7.69%
10.	/payment.html?securitytoken=[REDACTED PASSWORD]	1	7.69%

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Audience metrics

- Very detailed data about your website's visitors

- Frequently used reports:
  - Overview (selection of frequently used metrics)
  - Cohort analysis (visitor retention)
  - Lifetime Value (value of visitors per acquisition channel)
  - Demographics overview, Geo location
  - Interests (profile based on the data Google has about a visitor)
  - Behavior (New vs Returning customers)
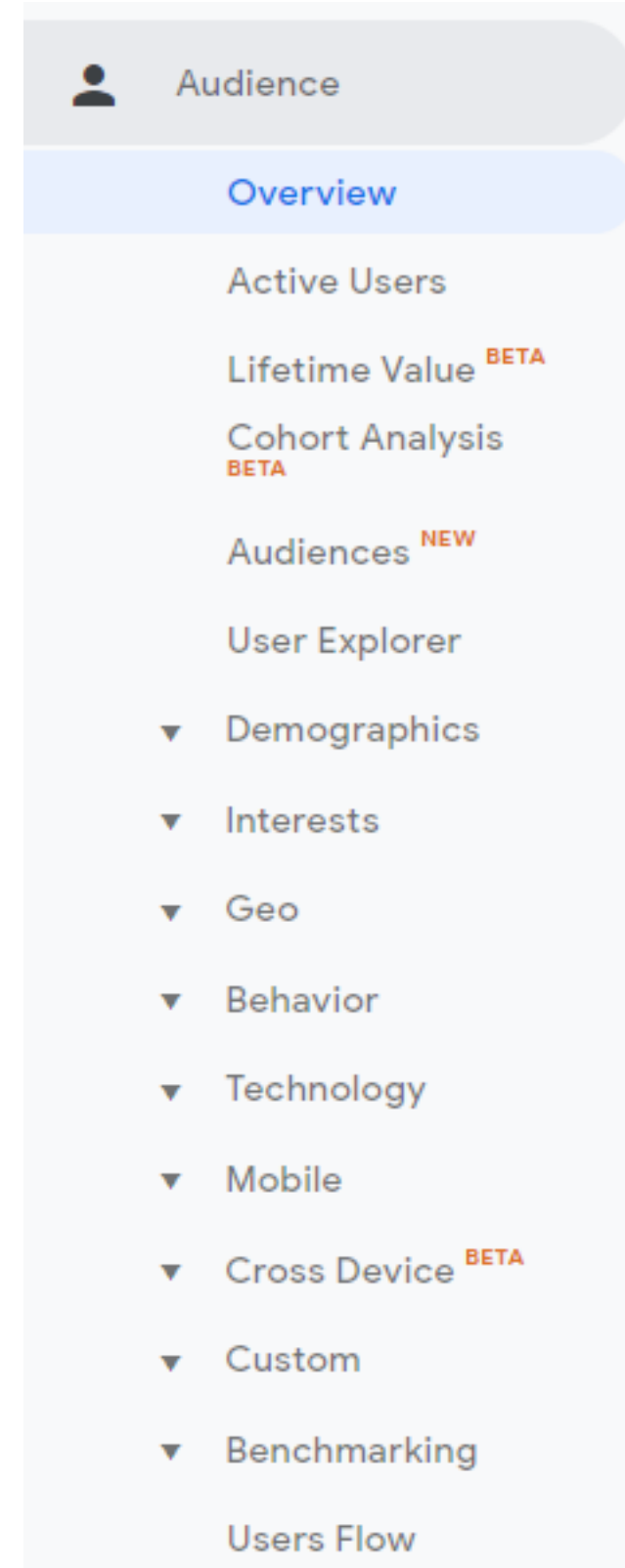
Audience
  Overview
  Active Users
  Lifetime Value BETA
  Cohort Analysis BETA
  Audiences NEW
  User Explorer
  ▼ Demographics
  ▼ Interests
  ▼ Geo
  ▼ Behavior
  ▼ Technology
  ▼ Mobile
  ▼ Cross Device BETA
  ▼ Custom
  ▼ Benchmarking
  Users Flow
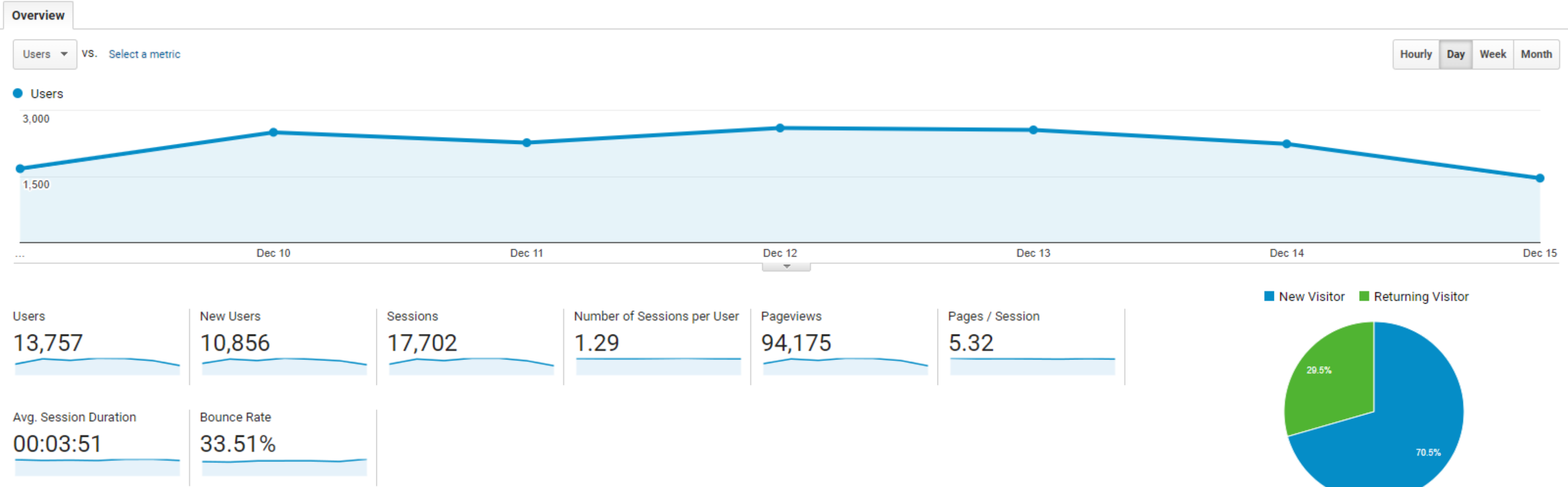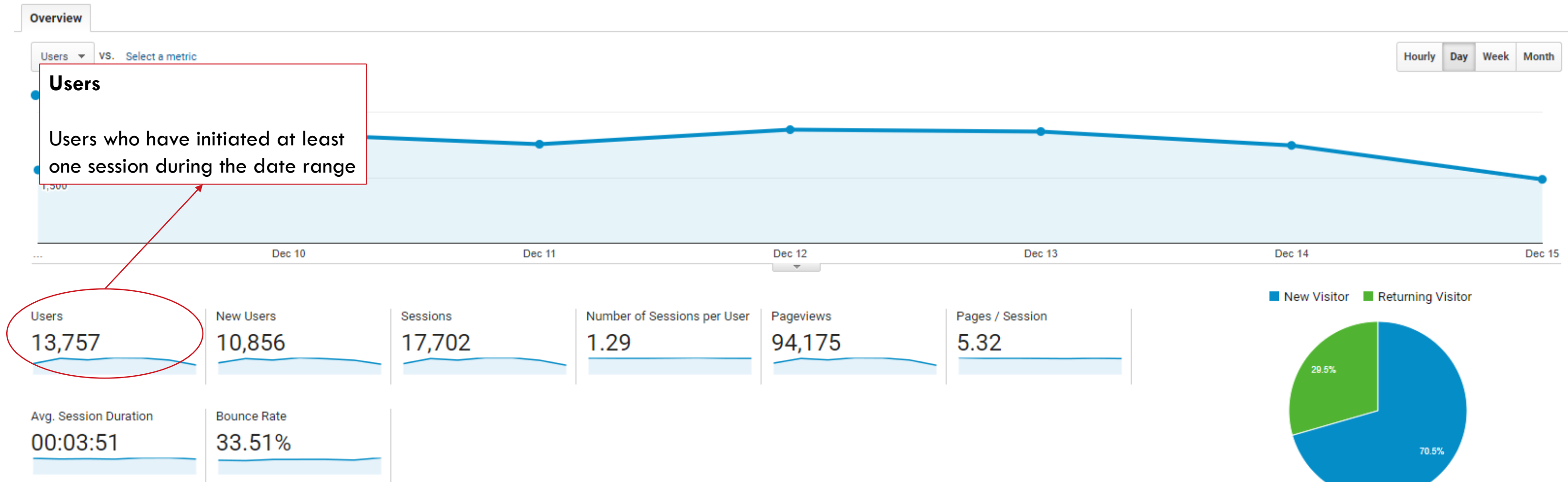
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Audience - Overview

Audience - Overview

Audience - Overview

Audience - Overview

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Audience - Overview

Avg. Session Duration

Average amount of time a visitor stays on your website In order to be tracked, a visitor must visit at least a second page on your website

Audience - Overview

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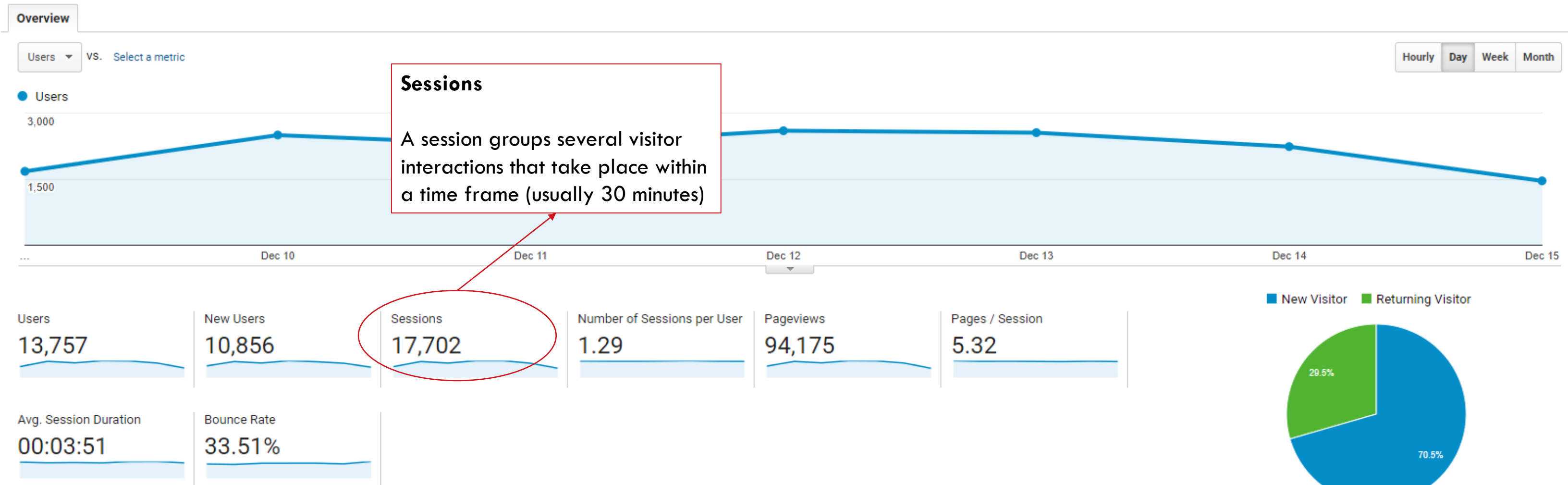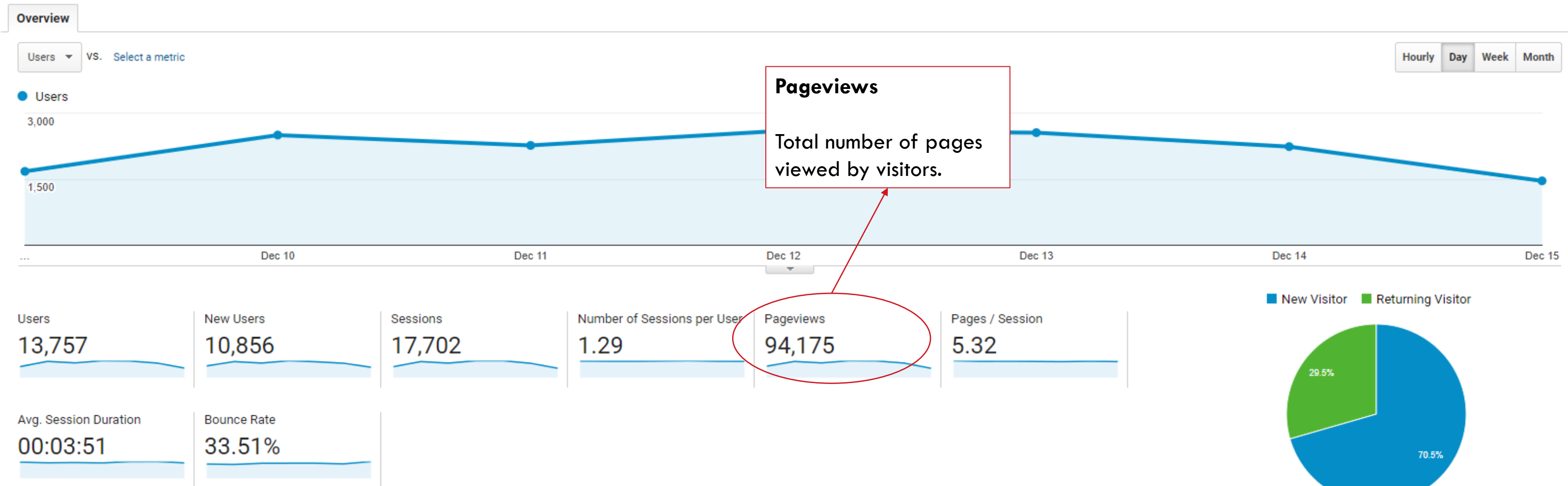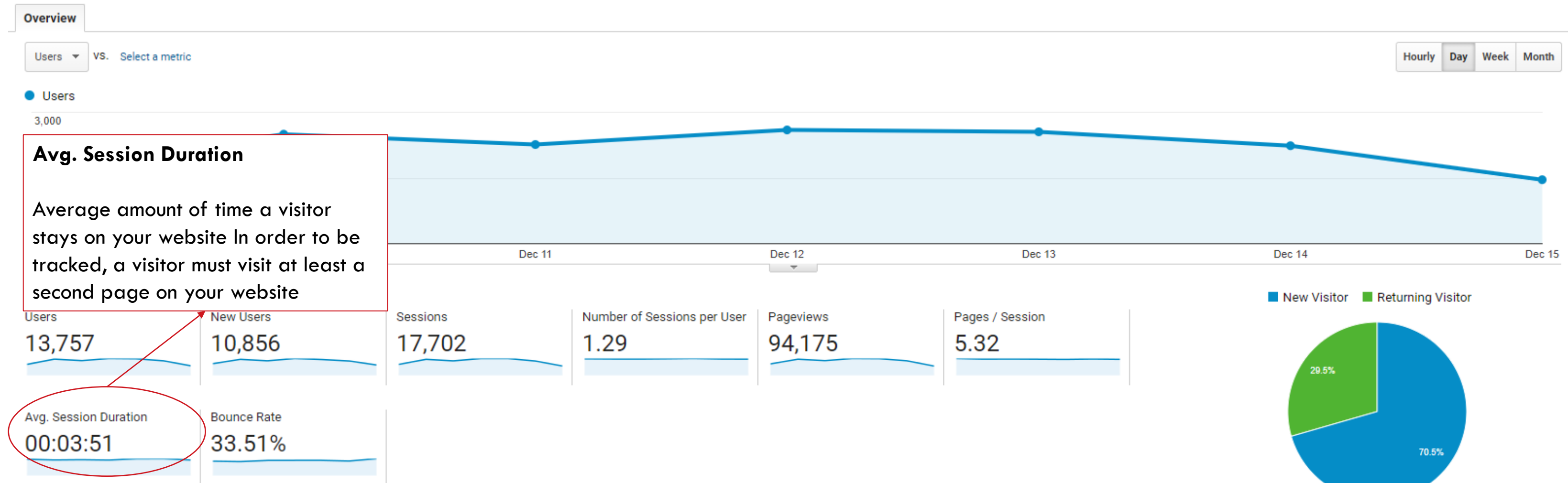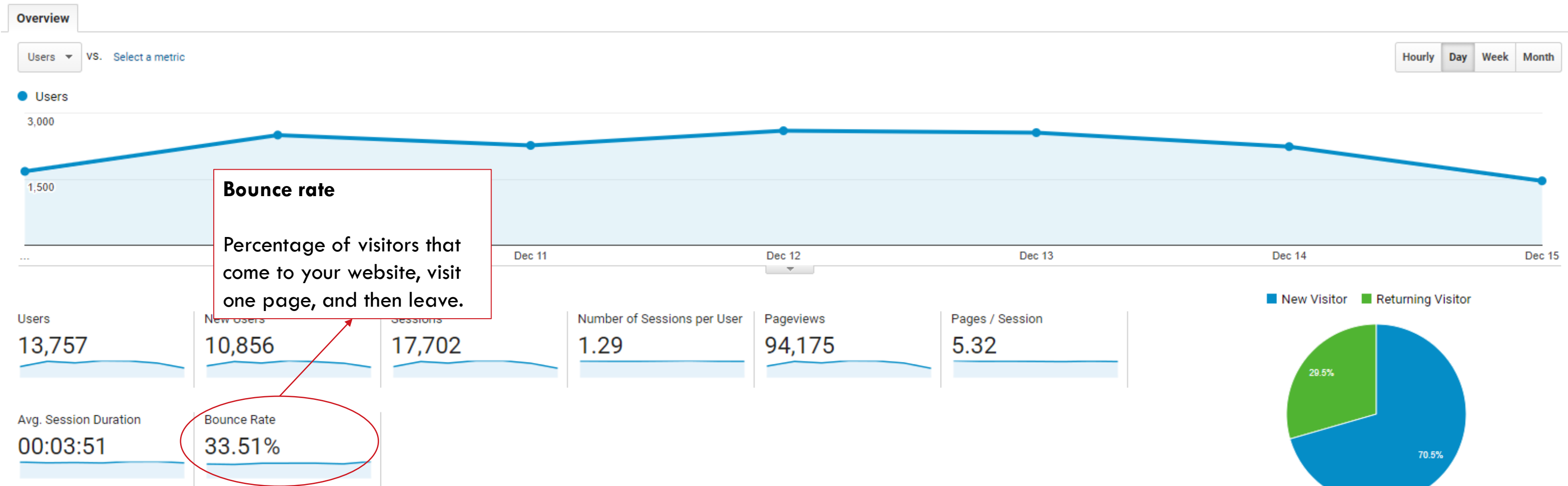
Audience – Cohort analysis

	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 11	Day 12
All Users 10,948 users	**100.00%**	**4.50%**	**1.94%**	**1.31%**	**0.74%**	**0.60%**	**0.36%**	**0.00%**					
Dec 9, 2018 1,274 users	100.00%	3.38%	1.88%	1.57%	0.94%	0.94%	0.86%	0.00%					
Dec 10, 2018 1,758 users	100.00%	6.77%	3.36%	2.90%	1.65%	0.91%	0.00%						
Dec 11, 2018 1,597 users	100.00%	4.51%	2.50%	1.44%	0.44%	0.00%							
Dec 12, 2018 1,855 users	100.00%	7.12%	2.48%	0.75%	0.00%								
Dec 13, 2018 1,752 users	100.00%	4.28%	1.26%	0.00%									
Dec 14, 2018 1,585 users	100.00%	3.28%	0.00%										
Dec 15, 2018 1,127 users	100.00%	0.00%											

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Audience — Cohort analysis

Visitors acquired on December 10 from all the users in the past 7 days

	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 11	Day 12
All Users 10,948 users	100.00%	4.50%	1.94%	1.31%	0.74%	0.60%	0.36%	0.00%					
Dec 9, 2018 1,274 users	100.00%	3.38%	1.88%	1.57%	0.94%	0.94%	0.86%	0.00%					
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Dec 14, 2018 1,585 users	100.00%	3.28%	0.00%										
Dec 15, 2018 1,127 users	100.00%	0.00%											

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Audience – Cohort analysis

Visitors acquired on December 10 that returned on December 11

	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 11	Day 12
All Users 10,948 users	**100.00%**	**4.50%**	**1.94%**	**1.31%**	**0.74%**	**0.60%**	**0.36%**	**0.00%**					
Dec 9, 2018 1,274 users	100.00%	3.38%	1.88%	1.57%	0.94%	0.94%	0.86%	0.00%					
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Dec 14, 2018 1,585 users	100.00%	3.28%	0.00%										
Dec 15, 2018 1,127 users	100.00%	0.00%											

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Audience – Interests overview

Key Metric: [Users ▾]

Affinity Category (reach)
61.30% of total users

3.43%	Shoppers/Value Shoppers
3.20%	Media & Entertainment/Movie Lovers
3.19%	Technology/Technophiles
2.99%	Lifestyles & Hobbies/Business Professionals
2.93%	Media & Entertainment/Music Lovers
2.81%	Sports & Fitness/Health & Fitness Buffs
2.49%	Lifestyles & Hobbies/Shutterbugs
2.44%	Shoppers/Luxury Shoppers
2.33%	Travel/Travel Buffs
2.32%	Banking & Finance/Avid Investors

In-Market Segment
56.79% of total users

2.94%	Consumer Electronics/Mobile Phones
2.83%	Employment/Career Consulting Services
2.18%	Software/Business & Productivity Software
2.09%	Travel/Hotels & Accommodations
2.00%	Employment
1.83%	Travel/Air Travel
1.81%	Financial Services/Investment Services
1.77%	Business Services/Advertising & Marketing Services
1.72%	Apparel & Accessories
1.57%	Computers & Peripherals/Computers/Laptops & Notebooks

Other Category
61.10% of total users

3.23%	Online Communities/Social Networks
2.37%	Arts & Entertainment/TV & Video/Online Video
2.22%	Internet & Telecom/Mobile & Wireless/Mobile Phones/Smart Phones
2.13%	Arts & Entertainment/Celebrities & Entertainment News
1.94%	Reference/General Reference/Dictionaries & Encyclopedias
1.61%	News/Weather
1.40%	Shopping/Consumer Resources/Coupons & Discount Offers
1.20%	Travel/Air Travel
1.19%	News/Politics/Campaigns & Elections
1.17%	Arts & Entertainment/Music & Audio/Pop Music

Visitor profiles based on browsing history and other data that Google has gathered

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Audience – Interests overview

Key Metric: Users ▾

Affinity Category (reach)
61.30% of total users

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2.44%		Shoppers/Luxury Shoppers
2.33%		Travel/Travel Buffs
2.32%		Banking & Finance/Avid Investors

Categories used by Google Ads and Google Trends

In-Market Segment
56.79% of total users

2.94%		Consumer Electronics/Mobile Phones
2.83%		Employment/Career Consulting Services
2.18%		Software/Business & Productivity Software
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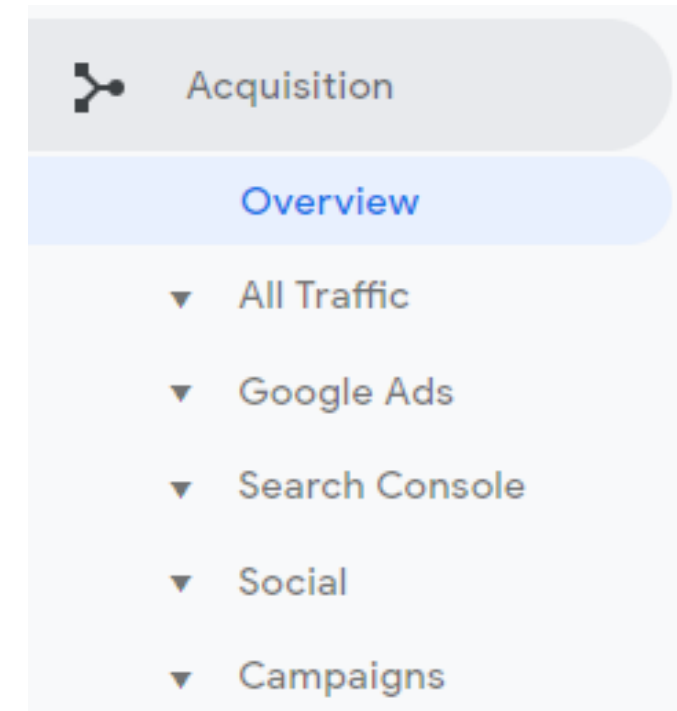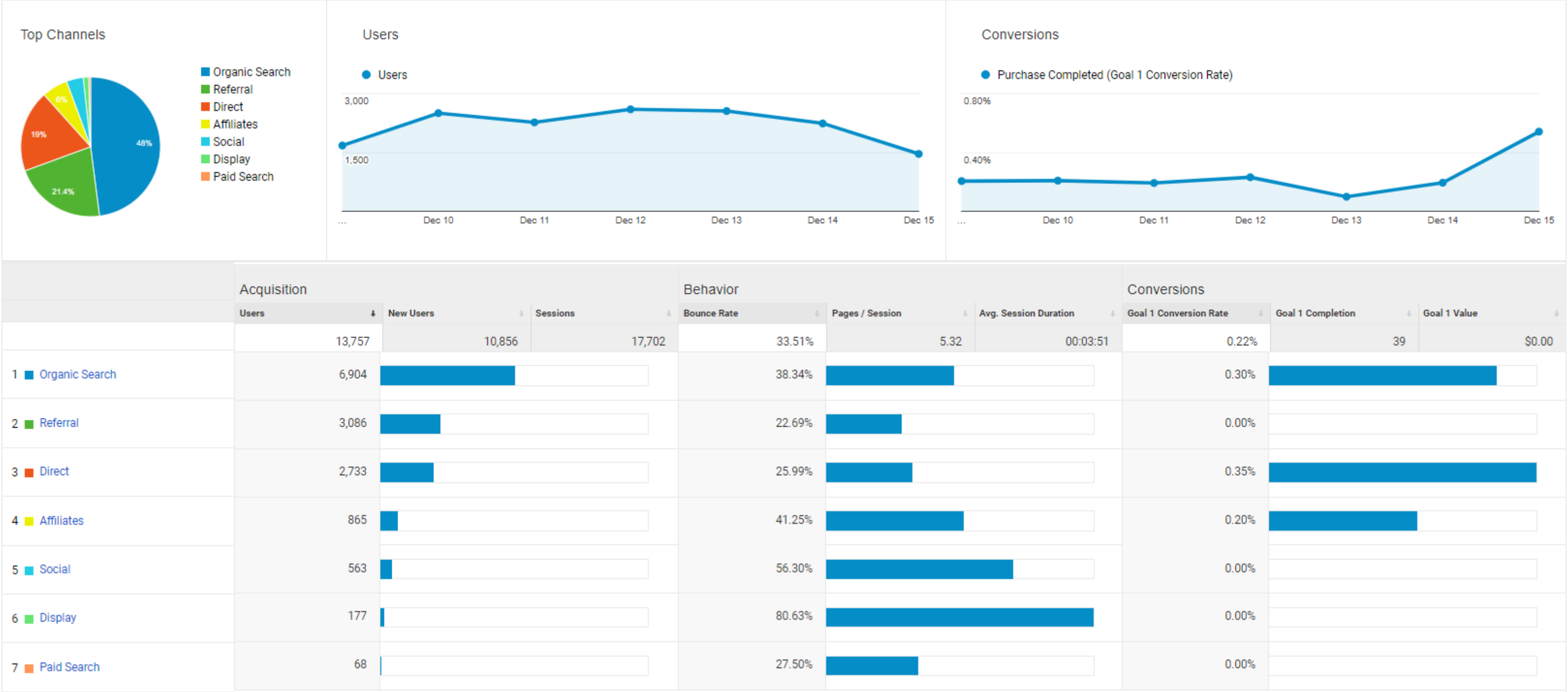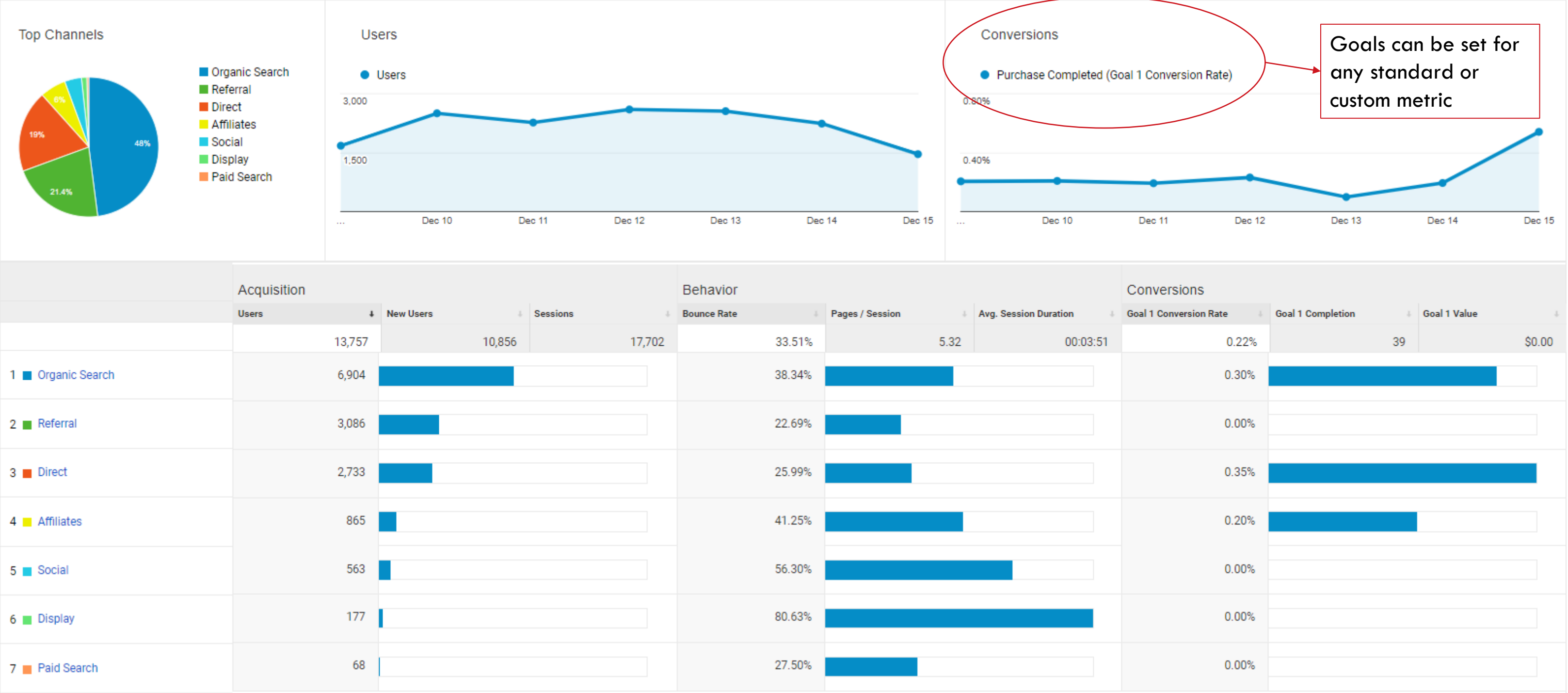|		
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2.37%		Arts & Entertainment/TV & Video/Online Video
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1.19%		News/Politics/Campaigns & Elections
1.17%		Arts & Entertainment/Music & Audio/Pop Music

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Acquisition metrics

- Data on sources of traffic for your website
- Integration with other Google tools (e.g.: Google Ads, Google Search Console)
  - Advertisement campaigns
  - Paid and organic keywords
- Includes data about social media referrals

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Acquisition – Overview

Top Channels

Pie chart:
- Organic Search — 48%
- Referral — 21.4%
- Direct — 19%
- Affiliates — 6%
- Social
- Display
- Paid Search

Users

● Users (line chart, 1,500–3,000, Dec 10 – Dec 15)

Conversions

● Purchase Completed (Goal 1 Conversion Rate) (line chart, 0.40%–0.80%, Dec 10 – Dec 15)

	Acquisition			Behavior			Conversions		
	Users	New Users	Sessions	Bounce Rate	Pages / Session	Avg. Session Duration	Goal 1 Conversion Rate	Goal 1 Completion	Goal 1 Value
	13,757	10,856	17,702	33.51%	5.32	00:03:51	0.22%	39	$0.00
1 ■ Organic Search	6,904			38.34%			0.30%		
2 ■ Referral	3,086			22.69%			0.00%		
3 ■ Direct	2,733			25.99%			0.35%		
4 ■ Affiliates	865			41.25%			0.20%		
5 ■ Social	563			56.30%			0.00%		
6 ■ Display	177			80.63%			0.00%		
7 ■ Paid Search	68			27.50%			0.00%		

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Acquisition – Overview

Top Channels (pie chart)
- Organic Search — 48%
- Referral — 21.4%
- Direct — 19%
- Affiliates — 6%
- Social
- Display
- Paid Search

Users (line chart, Dec 10 – Dec 15)

Conversions (line chart)
- Purchase Completed (Goal 1 Conversion Rate)

Goals can be set for any standard or custom metric

	Acquisition			Behavior			Conversions		
	Users	New Users	Sessions	Bounce Rate	Pages / Session	Avg. Session Duration	Goal 1 Conversion Rate	Goal 1 Completion	Goal 1 Value
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5 Social	563			56.30%			0.00%		
6 Display	177			80.63%			0.00%		
7 Paid Search	68			27.50%			0.00%		

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Acquisition – Overview

In this example:
What percentage of visitors converted into purchasers of at least one product

	Acquisition			Behavior			Conversions		
	Users	New Users	Sessions	Bounce Rate	Pages / Session	Avg. Session Duration	Goal 1 Conversion Rate	Goal 1 Completion	Goal 1 Value
	13,757	10,856	17,702	33.51%	5.32	00:03:51	0.22%	39	$0.00
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Acquisition – All Campaigns

Explorer

Summary   Site Usage   Goal Set 1   Ecommerce

Users ▾   VS.   Select a metric   Day Week Month

● Users

Primary Dimension: **Campaign**   Source   Medium   Source / Medium   Other ▾

Plot Rows   Secondary dimension ▾   Sort Type: Default ▾   advanced

	Campaign	Acquisition			Behavior			Conversions Goal 1: Purchase Completed ▾		
		Users ↓	New Users	Sessions	Bounce Rate	Pages / Session	Avg. Session Duration	Purchase Completed (Goal 1 Conversion Rate)	Purchase Completed (Goal 1 Completions)	Purchase Completed (Goal 1 Value)
		875 % of Total: 6.36% (13,757)	637 % of Total: 5.87% (10,856)	1,036 % of Total: 5.85% (17,702)	41.12% Avg for View: 33.51% (22.71%)	4.33 Avg for View: 5.32 (-18.66%)	00:02:59 Avg for View: 00:03:51 (-22.24%)	0.19% Avg for View: 0.22% (-12.38%)	2 % of Total: 5.13% (39)	$0.00 % of Total: 0.00% ($0.00)
☐	1. Data Share Promo	865 (98.86%)	637 (100.00%)	1,023 (98.75%)	41.25%	4.33	00:03:00	0.20%	2 (100.00%)	$0.00 (0.00%)
☐	2. AW - Google Brand	5 (0.57%)	0 (0.00%)	7 (0.68%)	28.57%	3.71	00:01:36	0.00%	0 (0.00%)	$0.00 (0.00%)
☐	3. AW - Apparel	2 (0.23%)	0 (0.00%)	2 (0.19%)	0.00%	2.50	00:00:42	0.00%	0 (0.00%)	$0.00 (0.00%)
☐	4. AW - Office	2 (0.23%)	0 (0.00%)	2 (0.19%)	0.00%	9.00	00:05:33	0.00%	0 (0.00%)	$0.00 (0.00%)
☐	5. AW - Bags	1 (0.11%)	0 (0.00%)	2 (0.19%)	100.00%	1.00	00:00:00	0.00%	0 (0.00%)	$0.00 (0.00%)

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Behavior metrics

- Data on what visitors do on your website
  - What pages they visit (e.g.: Landing page, Exit page, etc.)
  - What actions they perform on those pages (e.g.: Product click, Add/Remove from cart, Promotion click, etc.)

- Site speed
  - How long it takes for a page to load

- Experiments
  - Results of Optimization via A/B testing, Multivariate testing, Rerouting

	Behavior
	Overview
	Behavior Flow
▼	Site Content
▼	Site Speed
▼	Site Search
▼	Events
▼	Publisher
	Experiments

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Behavior – Overview

Overview

Pageviews ▼ VS. Select a metric

Hourly | **Day** | Week | Month

● Pageviews

20,000

10,000

... | Dec 10 | Dec 11 | Dec 12 | Dec 13 | Dec 14 | Dec 15

Pageviews	Unique Pageviews	Avg. Time on Page	Bounce Rate	% Exit
94,175	67,229	00:00:53	33.51%	18.79%

Site Content		
Page		▸
Page Title		
Brands (Content Group)		
Product Categories (Content Group)		
Clothing by Gender (Content Group)		
Site Search		
Search Term		
Events		
Event Category		

Page		Pageviews	% Pageviews
1. /home		13,531	14.37%
2. /basket.html		6,509	6.91%
3. /signin.html		3,529	3.75%
4. /google+redesign/apparel/mens/mens+warm+gear		3,458	3.67%
5. /google+redesign/bags		3,425	3.64%
6. /google+redesign/shop+by+brand/youtube		2,995	3.18%
7. /google+redesign/apparel/mens/mens+t+shirts		2,802	2.98%
8. /google+redesign/nest/nest-usa		2,637	2.80%
9. /google+redesign/apparel		2,438	2.59%
10. /asearch.html		2,355	2.50%

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Behavior – Overview

Behavior – Behavior flow

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Behavior – Behavior flow
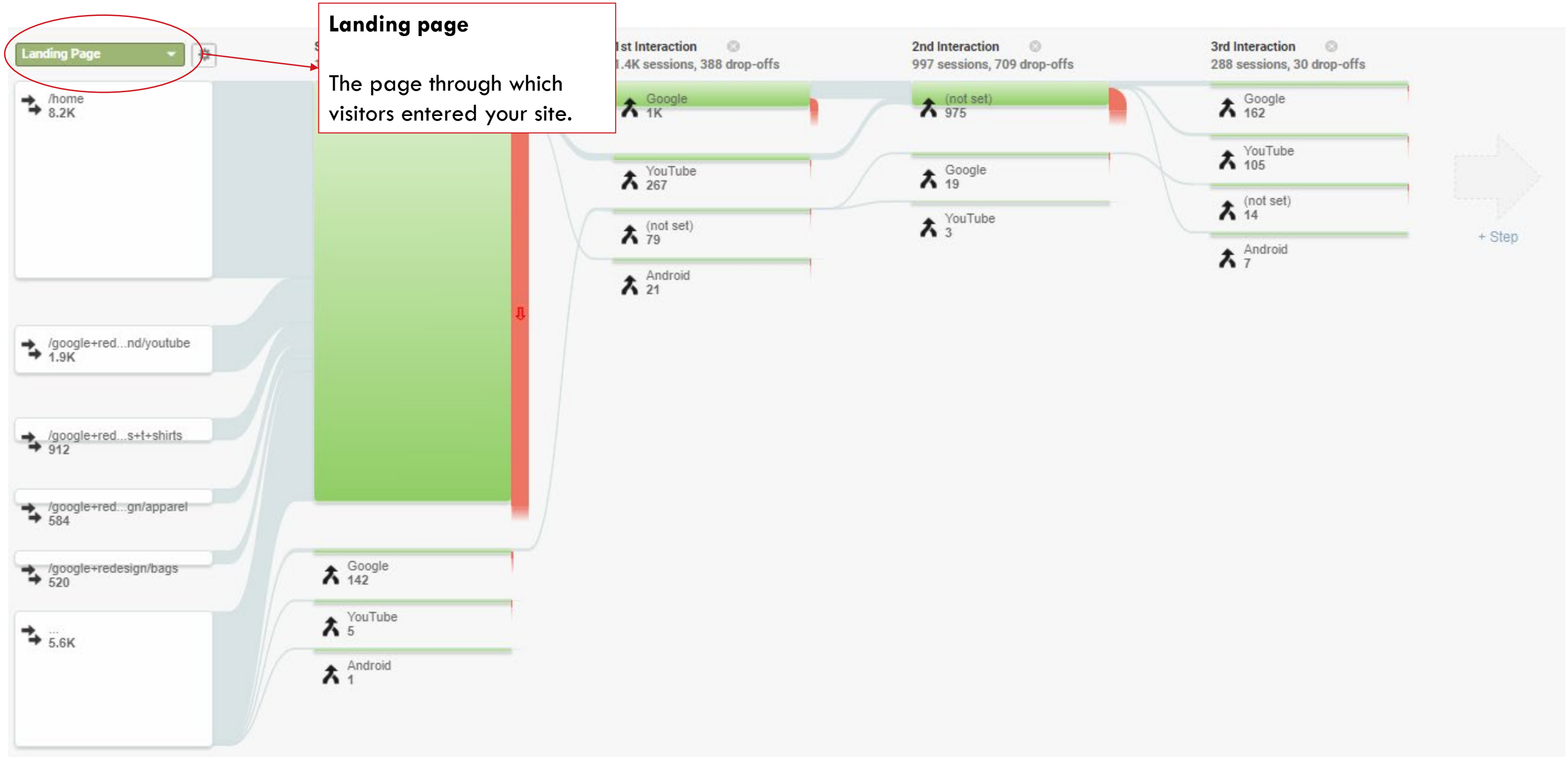
Conversion metrics

- Which goals have been achieved
  - Goals are custom targets that can be set based on interactions on your website
  - Interactions include form submissions, button clicks, e-book downloads, product purchase, etc.
  - Goal funnel visualization/Goal flow - splits the goal into several steps that can be tracked separately

- E-commerce purchases
  - Shopping and Checkout behavior, Product and Sales performance
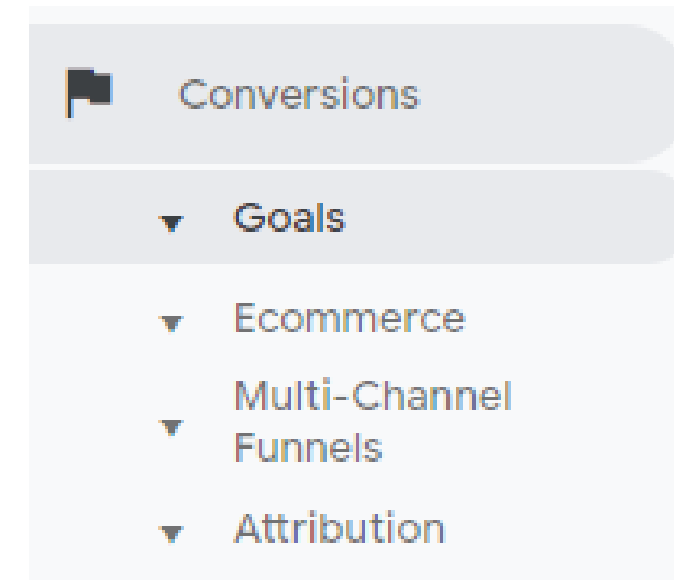
Conversions

Goals

Ecommerce

Multi-Channel Funnels

Attribution

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Conversions – Goals overview

Conversions – Goals overview

Number of times the goal was completed

The rate at which the goal was abandoned (the ratio of Abandoned Funnels to Goal Starts).

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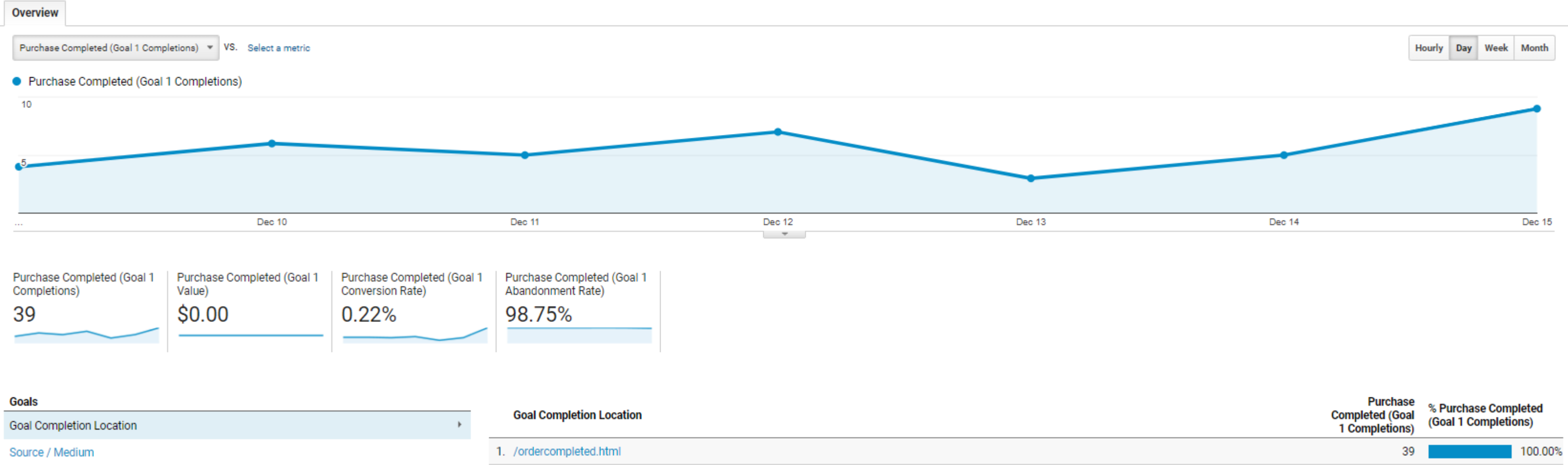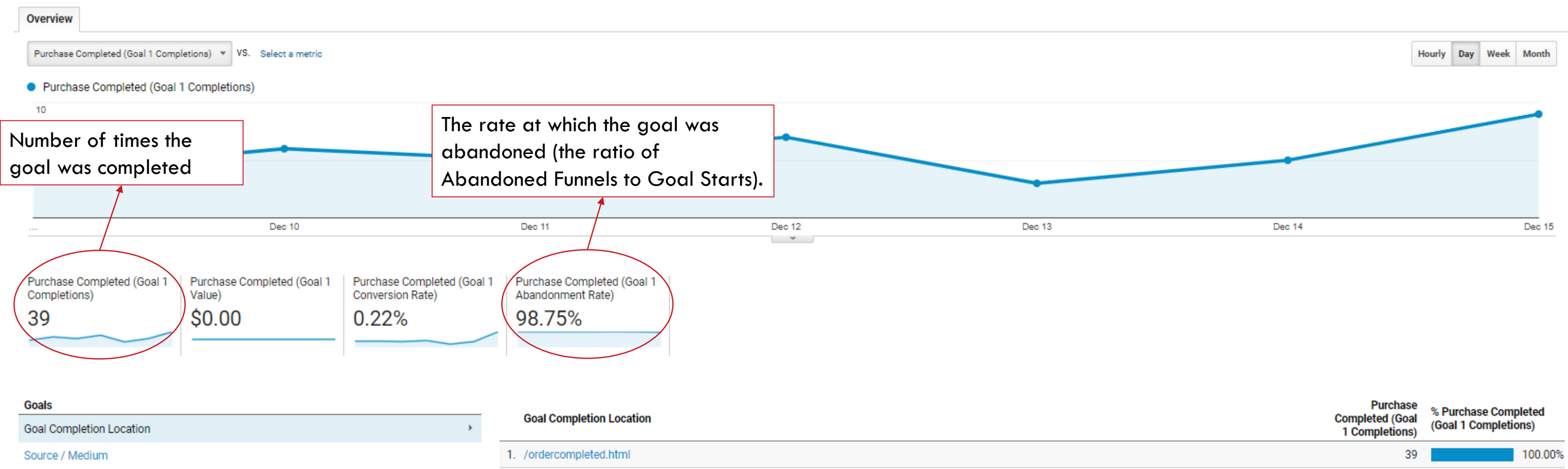
Conversions – Goals overview
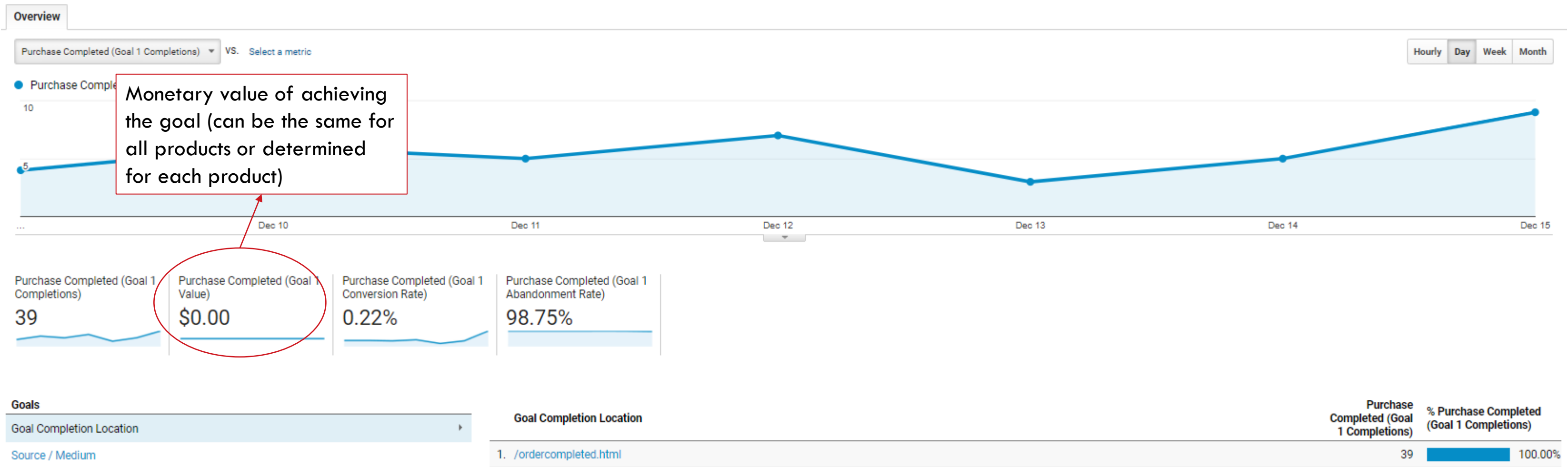
Conversions – Funnel visualization

Cart
3,098

3,098 ▶ | | 2,187

(entrance)	446
/google+redesign/nest/nest-usa/quickview	330
/home	197
/google+redesign/nest/nest-usa	124
/google+redesign/apparel/mens/mens+warm+gear/quickview	102

(exit)	697
/basket.html	375
/signin.html	236
/home	102
/store.html	89

911 (29.41%)
proceeded to Billing and Shipping

Billing and Shipping
911

0 ▶ | | 343

(exit)	161
/yourinfo.html	83
/basket.html	29
/home	11
/myaccount.html?mode=vieworder	9

568 (62.35%)
proceeded to Payment

Payment
568

0 ▶ | | 506

(exit)	267
/payment.html	75
/basket.html	41
/myaccount.html?mode=vieworder	35
/home	17

62 (10.92%)
proceeded to Review

Review
62

0 ▶ | | 23

(exit)	7
/revieworder.html	7
/basket.html	3
/myaccount.html?mode=billingaddress	3
/google+redesign/bags	1

Export CSV   ★ Add All Keywords

39 (62.90%)
proceeded to Purchase Completed

Purchase Completed
39

0 ▶

1.26% funnel conversion rate

43

Conversions – Ecommerce overview

Conversions – Shopping behavior

Legend: ■ Sessions ■ Shopping Progression ■ Abandonments

| | All Sessions 17,702 | Sessions with Product Views 5,111 28.87% | Sessions with Add to Cart 1,735 9.8% | Sessions with Check-Out 856 4.84% | Sessions with Transactions 37 0.21% |

Progression: 28.87% → 33.89% → 29.74% → 4.32%

| No Shopping Activity 12,426 70.2% | No Cart Addition 3,201 62.63% | Cart Abandonment 1,219 70.26% | Check-Out Abandonment 819 95.68% |

| Sessions | Abandonments | % Completion rate | | | | | | Search |

User Type ▾	All Sessions ↓	Sessions with Product Views	%	Sessions with Add to Cart	%	Sessions with Check-Out	%	Sessions with Transactions	%
1 New Visitor	10,869	2,807	25.83%	738	6.79%	311	2.86%	23	0.21%
2 Returning Visitor	6,833	2,304	33.72%	997	14.59%	545	7.98%	14	0.20%

Show rows: 10 ▾ Go to: 1 1 - 2 of 2 ◄ ►

Custom dashboard – Device used

Desktop Users
10,028
% of Total: 72.89% (13,757)

Mobile Users
3,432
% of Total: 24.95% (13,757)

Tablet Users
329
% of Total: 2.39% (13,757)

Desktop Pageviews
75,413
% of Total: 80.08% (94,175)

Mobile Pageviews
16,957
% of Total: 18.01% (94,175)

Tablet Pageviews
1,805
% of Total: 1.92% (94,175)

Revenue by Device Category

■ mobile ■ desktop ■ tablet

20.5%
$1,409.18
Revenue
75.3%

Revenue Per User

■ mobile ■ tablet ■ desktop

35%
$0.10
Revenu...
59.4%

mobile
$0.31 Revenue per User (59.4%)

Revenue and Revenue per User by Device Category

Device Category	Revenue	Revenue per User
mobile	$1,060.94	$0.31
desktop	$288.30	$0.03
tablet	$59.94	$0.18

Active Users

Total Users
13,757
% of Total: 100.00% (13,757)

Total Pageviews
94,175
% of Total: 100.00% (94,175)

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Custom dashboard in Google Data Studio

- Can use data from Google Analytics
- Can combine data from different sources
- Can make custom analysis

https://datastudio.google.com

A/B TESTING
- Google Optimize -

A/B testing

- Approach for optimizing user experience when using websites, software, etc.
  - Comparison between variations of a webpage
  - Based on empirical evidence from users
  - Each user sees only one variation of the webpage
  - Frequently used optimization goal is conversion rate

- Helps assess in an objective manner the value of a design, idea, campaign, etc.

- Large companies like Microsoft and Google have thousands of active experiments at any time

Kohavi, R., Deng, A., Frasca, B., Longbotham, R., Walker, T., & Xu, Y. (2012, August). Trustworthy online controlled experiments: Five puzzling outcomes explained. In Proceedings of the 18th ACM SIGKDD international conference on Knowledge discovery and data mining (pp. 786-794). ACM.

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A/B testing flow

- Split the users into two categories
  - Control (original version)
  - Treatment (variation version)

- Track the interactions of users via clicks, conversions, etc.

- Analyze and compare the results of the Treatment vs. Control user groups
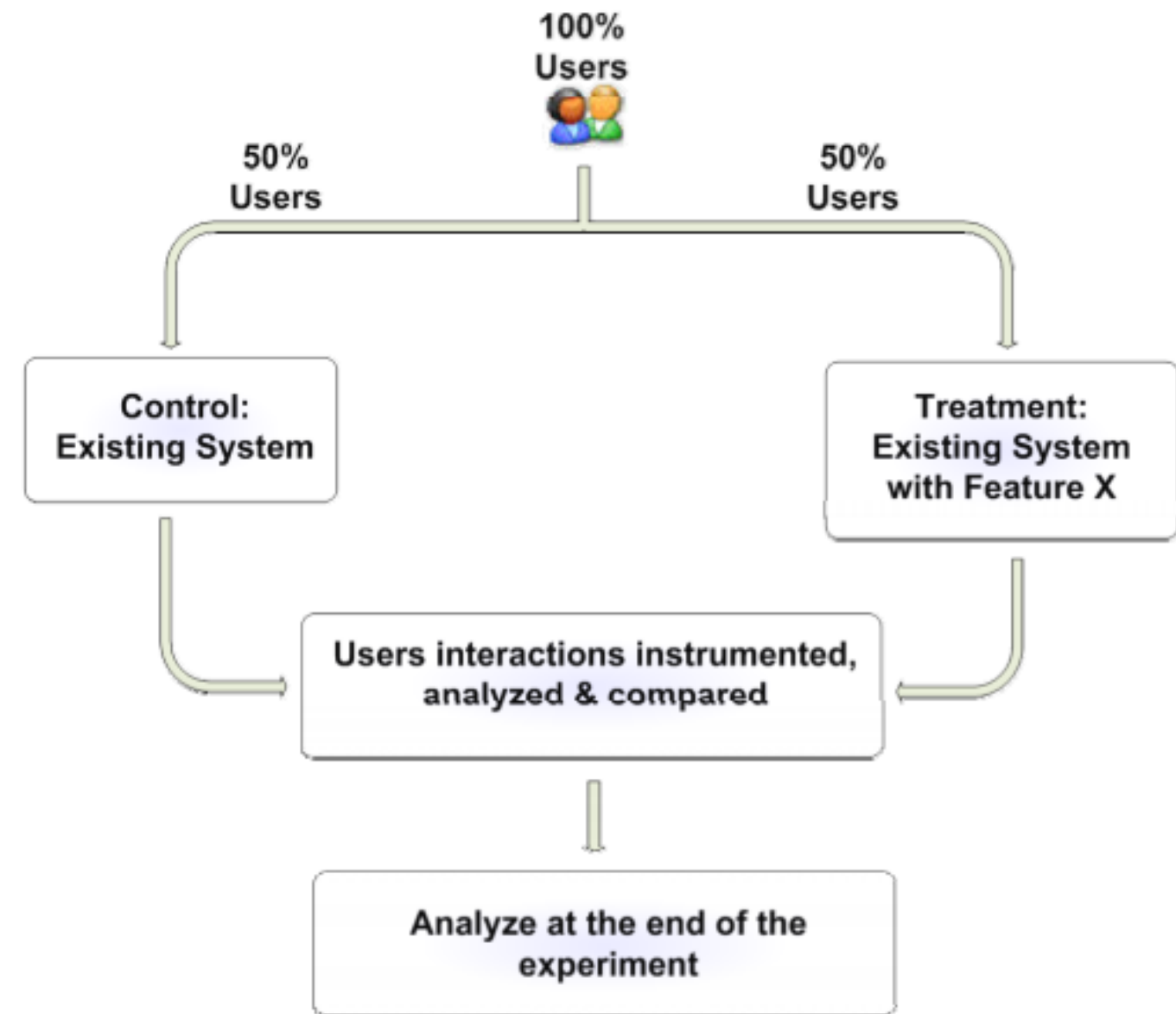
Figure 2: High-level flow for A/B test

Kohavi, R., Deng, A., Frasca, B., Longbotham, R., Walker, T., & Xu, Y. (2012, August). Trustworthy online controlled experiments: Five puzzling outcomes explained. In Proceedings of the 18th ACM SIGKDD international conference on Knowledge discovery and data mining (pp. 786-794). ACM.

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A/B testing example

- A/B is just the name, but there can be more than one variations/treatment groups

- Each variation has a clear difference to the original

- The objective in this example is an increase in average revenue per user

- Which one do you think performed the best? (10% increase in average revenue per user)

Control

Treatment1

Treatment 2

Treatment 3

Treatment 4

Treatment 5

Kohavi, R., Deng, A., Frasca, B., Longbotham, R., Walker, T., & Xu, Y. (2012, August). Trustworthy online controlled experiments: Five puzzling outcomes explained. In Proceedings of the 18th ACM SIGKDD international conference on Knowledge discovery and data mining (pp. 786-794). ACM.

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Primacy and Novelty effects

- Primacy effect
  - When something in changed on a website, experienced users might have a more difficult time navigating due to them being used to the old version
  - Thus, more clicks on a website

- Novelty effect
  - When something new is added, some users will investigate, click everywhere to discover new features
  - Thus, more clicks on a website
  - If the new feature is not useful, it will die out after a few days

Kohavi, R., Deng, A., Frasca, B., Longbotham, R., Walker, T., & Xu, Y. (2012, August). Trustworthy online controlled experiments: Five puzzling outcomes explained. In Proceedings of the 18th ACM SIGKDD international conference on Knowledge discovery and data mining (pp. 786-794). ACM.

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Google Optimize

- Free A/B testing and personalization tool from Google
- Integrates with Google Analytics
  - Data can be analyzed in Google Analytics
  - Only one line of code needs to be added to your website if Google Analytics is already being used
- Supports different variations including A/B testing, Multivariate tests (MVT), and Redirect tests
- Provides a drag-and-drop editor for making the different variations
- Includes advanced features that allow direct editing of HTML and adding of JavaScript functions
- Free online video tutorials

https://support.google.com/optimize/answer/7413967?hl=en

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Experiment types – A/B tests

- Also called A/B/n test
- Two or more variants of the same page
- Contain one or more elements that are modified from the original
  - E.g.: different image, different button color, different text, etc.
- Variants are provided to the target audience during similar time frames
- Target audience can be customized
  - E.g.: by country, by type of device, etc.
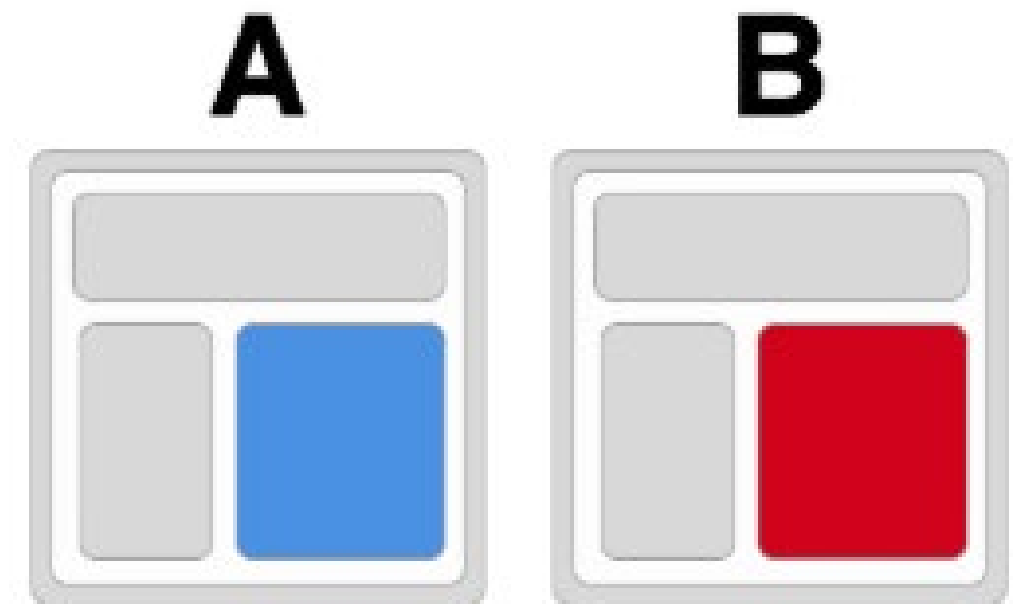
Experiment types – Multivariate tests

- Tests variants of two or more elements simultaneously to see which combination creates the best outcome

- Instead of focusing on the most effective page variant (A/B test), it identifies the most effective variant of each element as well as analyzing the interactions between those elements

- E.g.: can be used to test to headlines and three image variations for your home page

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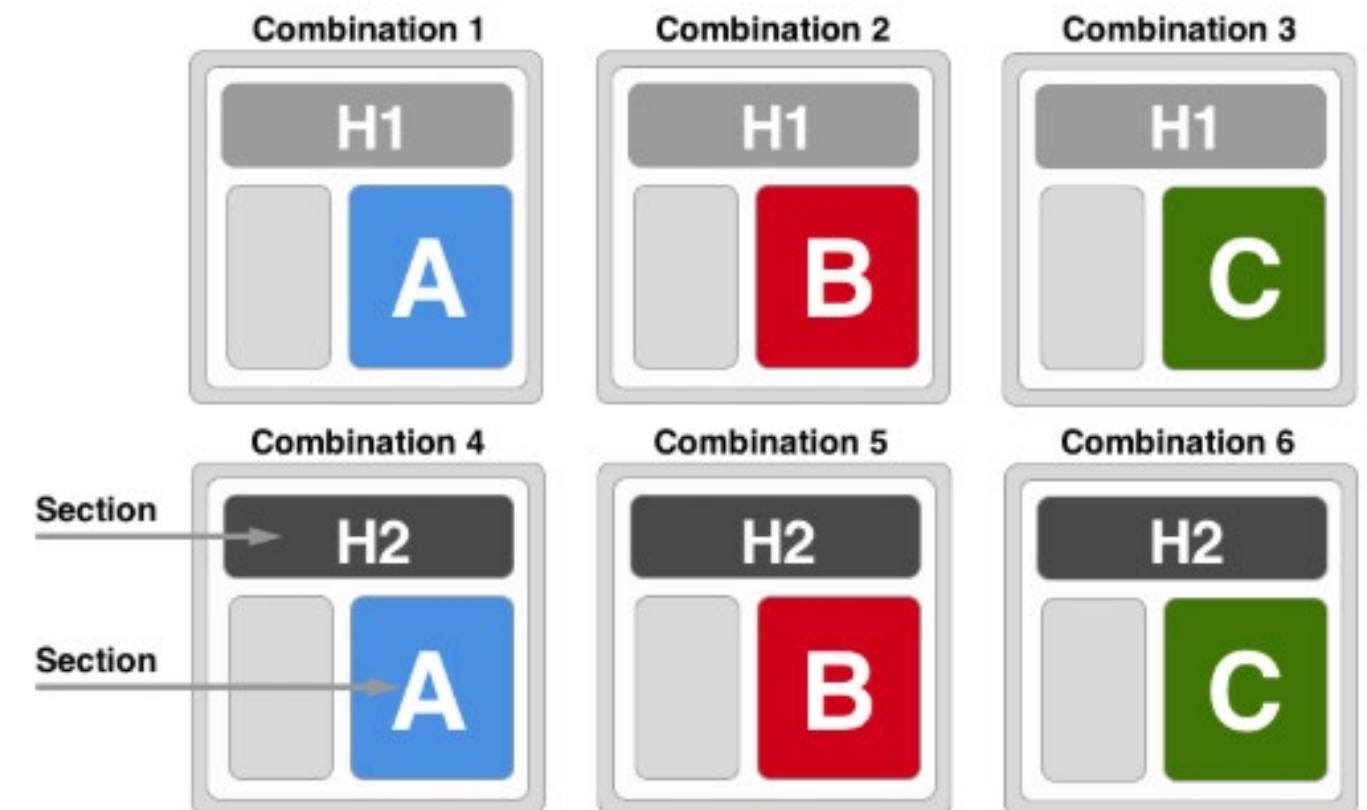
Experiment types – Redirect tests

- Tests two different web pages with separate URLs against each other

- Variants are identified by URL or path instead of an element on the page

- E.g.: Very useful when testing two very different landing pages, or a complete redesign of a page

Original

Variant

www.example.com

new.example.com

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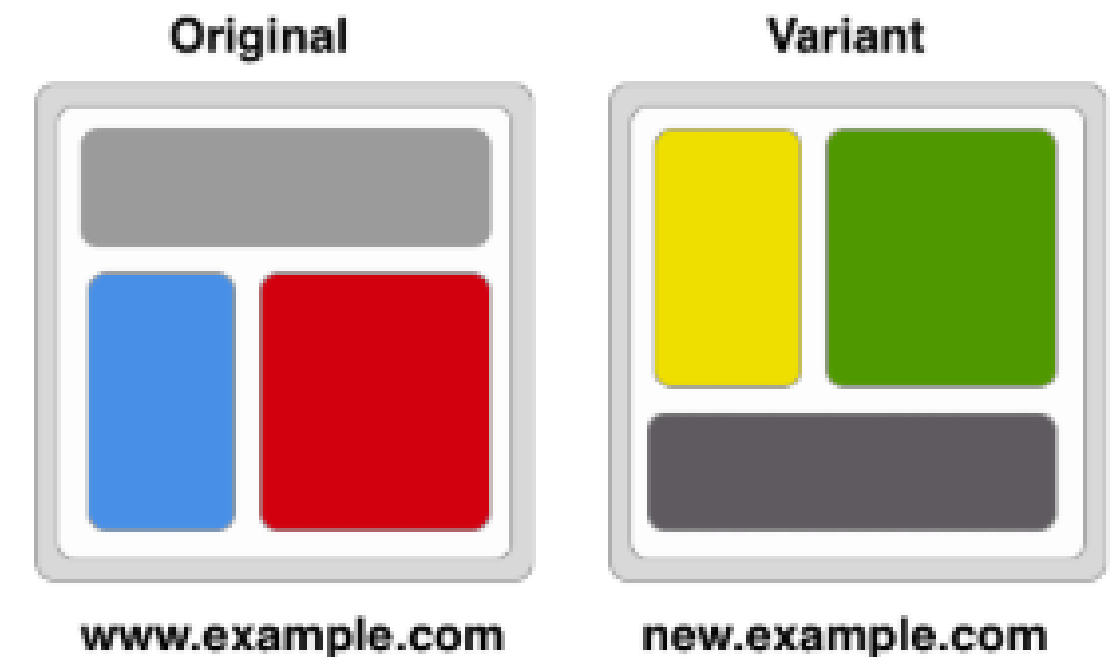
Experiment objectives

OBJECTIVES   TARGETING

Experiment objectives

Primary objective

Increase Reward Signups (Goal 5 Co...   ▼

Secondary objectives

+ ADD AN OBJECTIVE

Description and hypothesis

This test checks whether discount offers increase|

49 / 5000

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Experiment objectives

Can use the Goals defined in Google Analytics if the two tools are linked

OBJECTIVES   TARGETING

Experiment objectives

Primary objective

Increase Reward Signups (Goal 5 Co...

Secondary objectives

+ ADD AN OBJECTIVE

Description and hypothesis

This test checks whether discount offers increase|

49 / 5000

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Experiment targeting

OBJECTIVES   **TARGETING**

Who

Percentage of visitors to target ⑦   Weighting of visitors to target

↱ ——————————●   100.0 %   [50.0% | 50.0%] ◯ EDIT

When

Determines when the experiment is shown.

Evaluate on **page load** ✏

Additional conditions

URL matches   http://optimizedemo.weebly.com/store/c1/Featured_Products.html   ✏ 🗑

AND

59

Experiment targeting

OBJECTIVES   **TARGETING**

Who

What percentage of the website visitors should be included in the experiment

Percentage of visitors to target ?

100.0 %

Weighting of visitors to target

50.0%   50.0%   EDIT

When

Determines when the experiment is shown.

Evaluate on **page load**

Additional conditions

URL matches   http://optimizedemo.weebly.com/store/c1/Featured_Products.html

AND

Experiment targeting

OBJECTIVES **TARGETING**

Who

Percentage of visitors to target ⓘ

100.0 %

Weighting of visitors to target

What percentage visitors included in the experiment should see the original version

What percentage visitors included in the experiment should see the variant

50.0%   50.0%   EDIT

When

Determines when the experiment is shown.

Evaluate on **page load**

Additional conditions

URL matches   http://optimizedemo.weebly.com/store/c1/Featured_Products.html

AND

61

Experiment targeting

Who

Percentage of visitors to target ?

Weighting of visitors to target

⤴ ●————— 100.0 %

| 50.0% | 50.0% | ◯ EDIT |

W
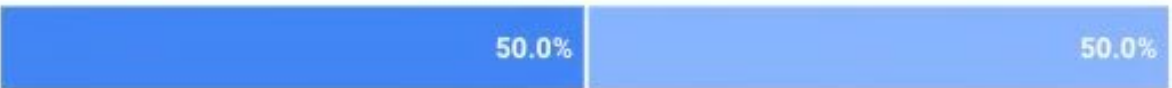
Advanced conditions for
narrowing the target
audience of the experiment

De   wn.

Evaluate on **page load** ✎

Additional conditions

URL matches   http://optimizedemo.weebly.com/store/c1/Featured_Products.html   ✎ 🗑

AND

Experiment targeting

Visual editor

Google Optimize reports

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Google Optimize reports

You have results - it's now safe to stop your experiment. There's no clear leader, so take a look at the data below.

EXPERIMENT SESSIONS

10,604

TOTAL

51 days running

The variant reduced the bounce rate

Improvement Overview

↑ Variant	Bounces	Purchase Completed (Goal 1 Completions) ✕
Original	baseline	baseline
YouTube Brand Page	-32.23% (-79.79%, 2.77%)	144.25% (-81.41%, 7,964.71%)

ADD NEW OBJECTIVE

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Google Optimize reports

You have results - it's now safe to stop your experiment. There's no clear leader, so take a look at the data below.

EXPERIMENT SESSIONS

10,604

TOTAL

51 days running

The variant increased goal completions

Improvement Overview

↑ Variant		Bounces	Purchase Completed (Goal 1 Completions) ✕
Original		baseline	baseline
YouTube Brand Page		-32.23% (-79.79%, 2.77%)	144.25% (-81.41%, 7,964.71%)

ADD NEW OBJECTIVE

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Google Optimize reports

Browsed > 5 Pages (Goal 2 Completions) ▼

↑ Variant	Improvement	Conversion Rate		Conversions	Experiment Sessions	Probability to beat baseline	Probability to be Best
☑ Original	baseline	8.38% (6.72%, 10.46%)		274	5,300	baseline	91%
☑ YouTube Brand Page	-19.5% (-41.19%, 10.21%)	6.75% (5.40%, 8.44%)		221	5,259	9%	9%

Conversion Rate Over time

Legend: ···· Original — YouTube Brand Page

Google Optimize reports

For Goal 2, the original still has the best performance

Browsed > 5 Pages (Goal 2 Completions)

↑ Variant	Improvement	Conversion Rate	Conversions	Experiment Sessions	Probability to beat baseline	Probability to be Best
Original	baseline	8.38% (6.72%, 10.46%)	274	5,300	baseline	91%
YouTube Brand Page	-19.5% (-41.19%, 10.21%)	6.75% (5.40%, 8.44%)	221	5,259	9%	9%

Conversion Rate Over time

Original
YouTube Brand Page

OTHER USEFUL GOOGLE TOOLS

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Other useful google tools

- Google Ads (make your own ad that appears in Google search and/or on banners)
- Google AdSense (make money by displaying ads on your website and YouTube channel)
- Google Search Console (measure site traffic and performance)
- Google Data Studio (make interactive dashboards based on Google Analytics data and more)
- Google Tag Manager (measure advertising ROI, track video and social networking sites)
- Google Trends (explore trends based on Google search keywords)
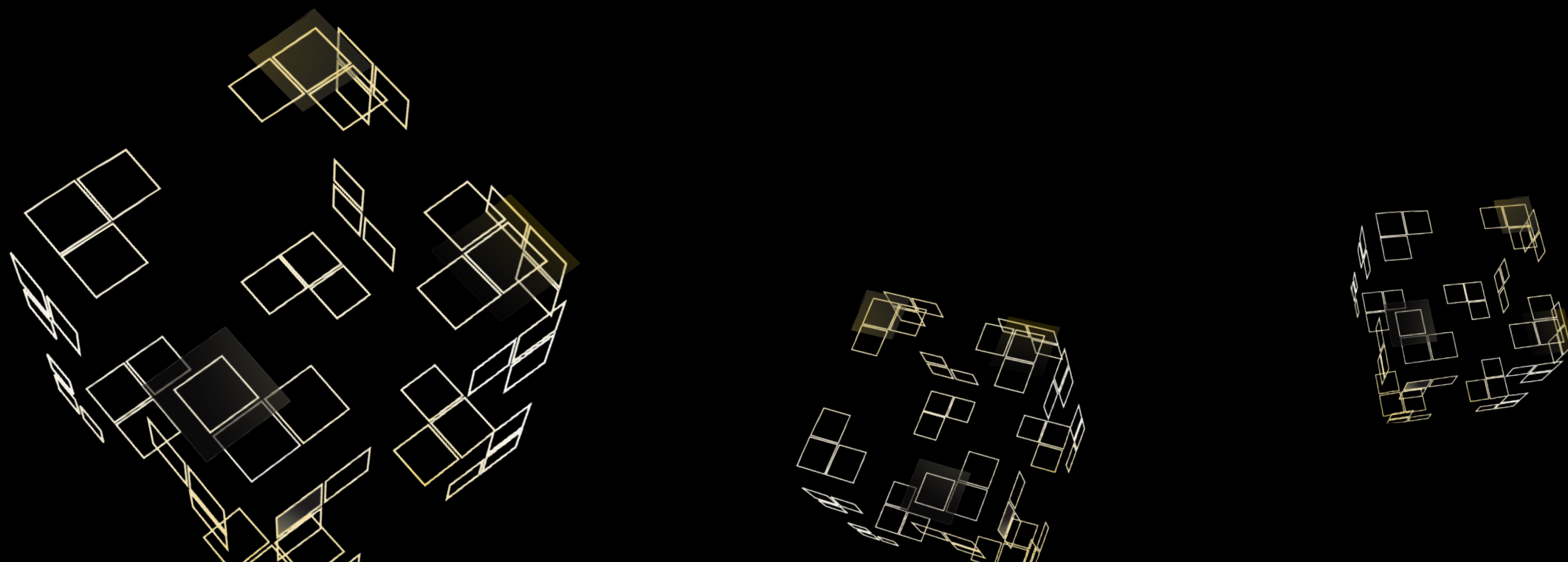- Google Correlate (find search patterns which correspond to real-world trends)

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MINI ASSIGNMENT

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Google Analytics mini assignment

- Make a Google Analytics account
- Import the demo dataset by following the instructions provided at:

https://support.google.com/analytics/answer/6367342?hl=en

- Explore the dataset by looking at the different standard reports
- Provide your conclusion in a few slides of one/several of the following:
  - A report/analysis that had results that were surprising/intriguing to you
  - A custom dashboard that focuses on several metrics/dimensions that you consider are important for monitoring/improving the business
  - A few recommendations for how one or more metrics could be improved
- Please include a screenshot of the report/analysis/dashboard you are referring to, together with a short bullet point explanation

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Thank you for your attention!

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