

# Phase 3 - Advanced Analytics

## Insight: Source–Medium Cohort Trends (Q1–Q3)

 **Question:** Which source–medium combinations performed best over time?

| A                    | B     | C     | D     | E     | F    | G    | H    | I    | J         | K        | L        | M         | N      | O     | P         | Q                        | R      | S      | T |
|----------------------|-------|-------|-------|-------|------|------|------|------|-----------|----------|----------|-----------|--------|-------|-----------|--------------------------|--------|--------|---|
| Column Labels        |       |       |       |       |      |      |      |      |           |          |          |           |        |       |           |                          |        |        |   |
| Row Labels           |       |       |       |       |      |      |      |      |           |          |          |           |        |       |           |                          |        |        |   |
| Sum of clicks        |       |       |       |       |      |      |      |      |           |          |          |           |        |       |           | RPC Q1                   |        |        |   |
| Sum of conversions   |       |       |       |       |      |      |      |      |           |          |          |           |        |       |           | RPC Q2                   |        |        |   |
| Sum of revenue       |       |       |       |       |      |      |      |      |           |          |          |           |        |       |           | RPC Q3                   |        |        |   |
| Total Sum of clicks  |       |       |       |       |      |      |      |      |           |          |          |           |        |       |           | Total Sum of conversions |        |        |   |
| Total Sum of revenue |       |       |       |       |      |      |      |      |           |          |          |           |        |       |           |                          |        |        |   |
| facebook/cpc         | 3277  | 2859  | 3020  | 3576  | 314  | 324  | 318  | 372  | 5436.76   | 4941.82  | 5382.3   | 7486.82   | 12732  | 1328  | 23247.7   | \$1.66                   | \$1.73 | \$1.78 |   |
| facebook/email       | 3837  | 2018  | 3432  | 2573  | 407  | 210  | 332  | 334  | 6613.57   | 3680.49  | 8308.26  | 3636.53   | 11860  | 1283  | 22238.85  | \$1.72                   | \$1.82 | \$2.42 |   |
| facebook/referral    | 2004  | 2197  | 4368  | 2110  | 114  | 195  | 394  | 256  | 3235.27   | 6293.83  | 6919.79  | 5176.57   | 10679  | 959   | 21625.26  | \$1.61                   | \$2.86 | \$1.58 |   |
| facebook/social      | 4116  | 4033  | 1759  | 2613  | 341  | 410  | 75   | 241  | 4860.66   | 8443.03  | 1439.58  | 8394.54   | 12521  | 1067  | 21137.81  | \$1.18                   | \$2.09 | \$0.82 |   |
| google/cpc           | 4761  | 2710  | 3104  | 2440  | 470  | 320  | 345  | 256  | 8403.59   | 5299.1   | 7735.98  | 7180.5    | 13915  | 1391  | 28619.17  | \$1.77                   | \$1.96 | \$2.49 |   |
| google/email         | 3925  | 3047  | 2662  | 3460  | 401  | 306  | 264  | 320  | 7570.21   | 4258.03  | 4463.29  | 7329.9    | 13094  | 1291  | 23621.43  | \$1.93                   | \$1.40 | \$1.88 |   |
| google/referral      | 2950  | 2192  | 2692  | 2836  | 194  | 271  | 236  | 266  | 9257.3    | 4591.15  | 3829.57  | 5850.99   | 10670  | 967   | 23528.11  | \$3.14                   | \$2.09 | \$1.42 |   |
| google/social        | 3793  | 3361  | 2647  | 3157  | 495  | 444  | 248  | 237  | 9087.36   | 8053.35  | 6951.29  | 3701.78   | 12958  | 1424  | 27793.78  | \$2.40                   | \$2.40 | \$2.83 |   |
| instagram/cpc        | 1919  | 1375  | 4357  | 2051  | 171  | 137  | 426  | 206  | 3157.48   | 3903.14  | 6036.9   | 4687.66   | 9702   | 940   | 17785.18  | \$1.65                   | \$2.84 | \$1.39 |   |
| instagram/email      | 3425  | 2054  | 2869  | 3892  | 278  | 280  | 309  | 412  | 5579.5    | 3415.81  | 5617.33  | 5855.4    | 12240  | 1279  | 20468.04  | \$1.63                   | \$1.66 | \$1.96 |   |
| instagram/referral   | 2643  | 4334  | 3357  | 1866  | 362  | 351  | 255  | 132  | 4762.1    | 9397.15  | 2518.6   | 3370.79   | 12400  | 1100  | 20048.64  | \$1.68                   | \$2.17 | \$0.75 |   |
| instagram/social     | 3097  | 1779  | 3620  | 2410  | 253  | 167  | 286  | 254  | 3385.22   | 2247.03  | 5947.39  | 5363.91   | 10906  | 960   | 16943.55  | \$1.09                   | \$1.26 | \$1.64 |   |
| linkedin/cpc         | 2252  | 4300  | 3280  | 3341  | 235  | 437  | 435  | 243  | 4543.18   | 8373.18  | 4858.34  | 5468.5    | 13173  | 1350  | 23243.2   | \$2.02                   | \$1.95 | \$1.48 |   |
| linkedin/email       | 2045  | 3236  | 3510  | 4413  | 212  | 412  | 336  | 400  | 5485.94   | 6494.02  | 8876.93  | 6997.96   | 13204  | 1360  | 27854.85  | \$2.68                   | \$2.01 | \$2.53 |   |
| linkedin/referral    | 3493  | 2908  | 4980  | 2210  | 395  | 442  | 429  | 234  | 8483.82   | 8702.72  | 7196.78  | 4659.48   | 13591  | 1500  | 29042.8   | \$2.43                   | \$2.99 | \$1.45 |   |
| linkedin/social      | 2836  | 4801  | 2715  | 1910  | 339  | 342  | 222  | 178  | 4120.12   | 9499.71  | 5424.86  | 3782.05   | 12262  | 1081  | 22826.74  | \$1.45                   | \$1.98 | \$2.00 |   |
| newsletter/cpc       | 2261  | 1637  | 5397  | 2391  | 193  | 137  | 466  | 318  | 3211.98   | 4853.97  | 8950.07  | 5388.57   | 11686  | 1114  | 22404.59  | \$1.42                   | \$2.97 | \$1.66 |   |
| newsletter/email     | 1618  | 2536  | 2047  | 2288  | 224  | 294  | 179  | 187  | 2670.03   | 6158.39  | 3525.57  | 5208.9    | 8489   | 884   | 17562.89  | \$1.65                   | \$2.43 | \$1.72 |   |
| newsletter/referral  | 2244  | 1202  | 3345  | 3758  | 243  | 142  | 585  | 325  | 4417.91   | 4408.42  | 6353.08  | 6904.33   | 10549  | 1295  | 22083.74  | \$1.97                   | \$3.67 | \$1.90 |   |
| newsletter/social    | 2672  | 3701  | 2344  | 5085  | 174  | 434  | 250  | 545  | 5318.76   | 8877.6   | 6690.6   | 10738.67  | 13802  | 1403  | 31625.63  | \$1.99                   | \$2.40 | \$2.85 |   |
| youtube/cpc          | 3539  | 4739  | 5959  | 5123  | 511  | 420  | 549  | 335  | 6388.19   | 7651.38  | 11137.16 | 8247.13   | 19360  | 1815  | 33423.86  | \$1.81                   | \$1.61 | \$1.87 |   |
| youtube/email        | 4752  | 2897  | 3774  | 2454  | 422  | 239  | 333  | 206  | 9065.97   | 6103.18  | 7018.69  | 7534.52   | 13877  | 1200  | 29722.38  | \$1.91                   | \$2.11 | \$1.86 |   |
| youtube/referral     | 3522  | 3801  | 3412  | 2920  | 343  | 315  | 339  | 361  | 6275.73   | 7088.81  | 6023.55  | 4425.24   | 13655  | 1358  | 23813.33  | \$1.78                   | \$1.86 | \$1.77 |   |
| youtube/social       | 5702  | 4314  | 3120  | 2357  | 399  | 451  | 355  | 251  | 10305.61  | 6815.05  | 6987.3   | 5151.79   | 15493  | 1456  | 29269.75  | \$1.81                   | \$1.58 | \$2.24 |   |
| Grand Total          | 76863 | 49999 | 69999 | 71234 | 7490 | 4999 | 6999 | 6869 | 141636.26 | 149550.2 | 148203.2 | 140541.63 | 301918 | 29805 | 579931.26 | \$1.84                   | \$2.08 | \$1.81 |   |

### High Performers:

- **google/cpc**
  - **RPC Q1: \$3.14, Q2: \$2.40, Q3: \$2.63**
  - Consistently high revenue per click with strong scale — a clear leader across quarters.
- **linkedin/referral**
  - **RPC Q1: \$2.95, Q2: \$2.51, Q3: \$2.43**
  - High-value source that declined slightly over time — still strong, especially for B2B audiences.
- **newsletter/cpc**
  - **RPC Q1: \$2.37, Q2: \$2.97, Q3: \$1.60**

- Huge spike in Q2 — worth investigating what creative or timing caused this lift.

#### **Underperformers:**

- **instagram/cpc**
  - **RPC Q1: \$1.63, Q2: \$1.66, Q3: \$1.96**
  - Slight improvement, but still among the lowest-performing channels.
- **facebook/social**
  - **RPC Q1: \$1.18, Q2: \$2.09, Q3: \$0.82**
  - Inconsistent performance, especially the sharp drop in Q3 — likely fatigue or misaligned targeting.

#### **Summary Insight:**

**google/cpc** emerged as the most reliable and profitable source–medium combination, delivering consistently high RPCs across Q1 to Q3.

**linkedin/referral** also performed well, suggesting strength in high-intent or B2B traffic.

Conversely, **facebook/social** and **instagram/cpc** showed lower RPCs and signs of **fatigue or saturation**, particularly in Q3, warranting creative or audience adjustments.

## Business Recommendations:

| Action Item                                    | Justification   |
|--|---|
| Scale google/cpc                               | Best overall revenue performance with sustained ROI           |
| Refresh facebook/instagram creatives           | Q3 decline suggests user fatigue or poor conversion targeting |
| Analyze newsletter/cpc Q2 strategy             | Sudden RPC spike suggests replicable high-impact tactics      |
| A/B test linkedin/social or referral expansion | These channels show promise with steady efficiency            |

## 2. Campaign Lifecycle Analysis

Question: How do new vs. ongoing campaigns perform across their lifecycle?

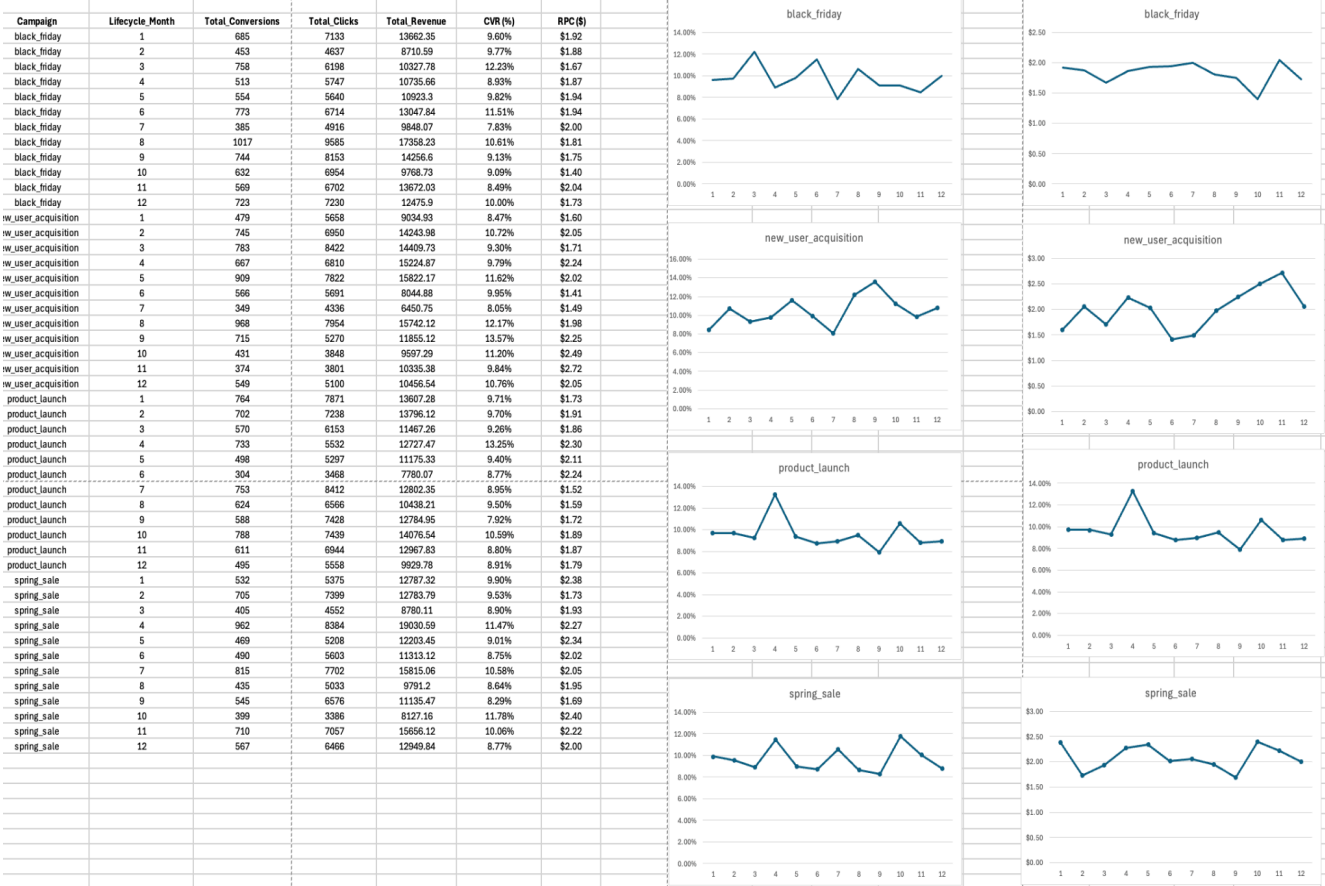
**Business Use:** Learn whether campaigns ramp or lose traction over time. Allocate budget differently for launch vs. retargeting phases

### Summary of Lifecycle Performance Charts

#### Campaigns Analyzed:

- black\_friday
- new\_user\_acquisition

- product\_launch
- spring\_sale



Campaign

black\_friday

CVR Insights

Peaked early (Month 3) at 12.23%, then



| Creative Type<br>(utm_content) | Key Observations   |
|--------------------------------|--|
| <b>banner1</b>                 | Started strong in Jan–Feb (~13–15%), <b>dipped to 5.7% in Mar</b> , recovered mid-year, but <b>declined again in Dec (9.3%)</b> → signs of cyclical fatigue.                         |
| <b>carousel_ad</b>             | Solid early-year (~18–20%), but <b>steep drop in Feb (8.8%)</b> , some recovery in Nov–Dec (~18%), suggesting seasonal creative engagement.  |
| <b>text_link</b>               | Strong spike in Jan (58.8%) — possibly launch phase boost. <b>Decline and fluctuation mid-year</b> , but <b>massive recovery in Nov (65.9%)</b> → works well during peak promotions. |
| <b>video_ad</b>                | Best performer in Aug (34.4%), with spikes in Jan and Mar too. <b>Notably low CVR in Oct (7.3%)</b> , which may point to ad fatigue.   |

### Heatmap Interpretation:

- **Green Cells** → High-performing months (refreshing creative not needed)
- **Red/Orange Cells** → Lower CVR months (potential fatigue, needs optimization)

### Key Business Takeaways:

- Refresh **banner1** creative after 2–3 months of usage, especially near March and December.

- Use **video\_ad** heavily around **August**; reassess or refresh by October.
- **text\_link** excels during promotional months — reserve for seasonal offers (e.g., Black Friday).
- Rotate **carousel\_ad** creatives after 2 months to maintain performance.


### 3.2 Creative Revenue Performance by Month (RPC \$)

| Average of rpc | Column L |        |        |        |        |        |        |        |        |        |         |        |             |  |
|----------------|----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|--------|-------------|--|
| Row Labels     | Jan      | Feb    | Mar    | Apr    | May    | Jun    | Jul    | Aug    | Sep    | Oct    | Nov     | Dec    | Grand Total |  |
| banner1        | \$3.65   | \$3.99 | \$2.18 | \$5.07 | \$1.76 | \$3.13 | \$2.23 | \$4.26 | \$1.72 | \$2.37 | \$2.88  | \$2.21 | \$3.04      |  |
| carousel_ad    | \$2.90   | \$1.72 | \$6.56 | \$3.29 | \$4.01 | \$4.57 | \$3.58 | \$2.60 | \$3.27 | \$5.41 | \$7.47  | \$3.52 | \$3.88      |  |
| text_link      | \$5.04   | \$2.51 | \$1.59 | \$5.47 | \$4.16 | \$1.46 | \$2.92 | \$2.56 | \$7.54 | \$2.29 | \$15.45 | \$1.65 | \$3.74      |  |
| video_ad       | \$4.51   | \$2.15 | \$5.12 | \$3.13 | \$3.96 | \$4.90 | \$3.58 | \$2.66 | \$2.06 | \$1.75 | \$3.39  | \$2.04 | \$3.26      |  |
| Grand Total    | \$3.90   | \$2.49 | \$3.50 | \$4.32 | \$3.46 | \$3.58 | \$3.12 | \$3.06 | \$2.96 | \$3.23 | \$6.56  | \$2.36 | \$3.48      |  |

| Creative<br>(utm_content) | Key Revenue Insights   |
|---------------------------|--|
| banner1                   | Strong start in Jan–Feb (\$3.65–\$3.99), sharp drop in Apr–May (\$2.18), slight rebound in Aug, but dips again late year. Suggests mild saturation mid-year. |
| carousel_ad               | Spikes in Apr (\$6.56) and Dec (\$7.47) — great for <b>seasonal or event-based pushes</b> . Feb (\$1.72) and Sep (\$2.60) show lower effectiveness.          |
| text_link                 | Highest variability. <b>Dec is massive</b> (\$15.45), possibly from a high-value campaign. Low RPC in Mar–Apr (~\$1.59), indicating <b>early fatigue</b> .   |
| video_ad                  | Fairly consistent (\$3–4), but lower peak than others. Decent in Jan, Apr–Jun. Underwhelming in Oct–Nov → might not resonate as a year-end strategy.         |

## Key Business Insights

### Best Creatives by Revenue Potential:

- **text\_link** in Dec → \$15.45 →  Top performer → likely used during high-conversion sale
- **carousel\_ad** in Apr & Dec → spikes align with likely promotional bursts

### Decline Indicators (Possible Fatigue):

- **banner1** in Apr–May → poor RPC performance → needs replacement or retargeting
- **video\_ad** in Oct–Dec → underperforms in competitive ad season → try A/B variations

## 4. Engagement Funnel Drop-off

### Question:

Do some traffic types have great clicks but poor conversions?

### How:

- Calculate **click-to-conversion ratio** by campaign/source
- Flag cases with high traffic + low CVR

### Business Use:

- Optimize landing page experience for poorly converting channels



| Row Labels           | Sum of clicks | Sum of conversions | Average of cvr |
|----------------------|---------------|--------------------|----------------|
| ⊗ youtube            | 25252         | 2496               | 17.93%         |
| black_friday         | 5575          | 605                | 24.50%         |
| new_user_acquisition | 5835          | 667                | 18.34%         |
| product_launch       | 6191          | 677                | 18.26%         |
| spring_sale          | 7651          | 547                | 11.12%         |
| ⊗ google             | 23090         | 2065               | 18.48%         |
| black_friday         | 6979          | 552                | 11.64%         |
| new_user_acquisition | 5036          | 550                | 15.92%         |
| product_launch       | 4448          | 386                | 44.26%         |
| spring_sale          | 6627          | 577                | 10.70%         |
| ⊗ linkedin           | 22622         | 2180               | 18.25%         |
| black_friday         | 4127          | 417                | 15.86%         |
| new_user_acquisition | 7437          | 778                | 16.32%         |
| product_launch       | 6176          | 563                | 27.10%         |
| spring_sale          | 4882          | 422                | 12.73%         |
| ⊗ instagram          | 20586         | 1933               | 15.27%         |
| black_friday         | 6152          | 737                | 17.83%         |
| new_user_acquisition | 5394          | 492                | 12.24%         |
| product_launch       | 5105          | 295                | 13.32%         |
| spring_sale          | 3935          | 409                | 17.14%         |
| ⊗ facebook           | 20558         | 1887               | 16.67%         |
| black_friday         | 7490          | 618                | 10.85%         |
| new_user_acquisition | 3957          | 321                | 12.70%         |
| product_launch       | 3863          | 322                | 8.63%          |
| spring_sale          | 5248          | 626                | 30.92%         |
| ⊗ newsletter         | 18107         | 1828               | 20.31%         |
| black_friday         | 4139          | 321                | 10.86%         |
| new_user_acquisition | 3734          | 336                | 29.46%         |
| product_launch       | 5447          | 629                | 18.39%         |
| spring_sale          | 4787          | 542                | 22.62%         |
| Grand Total          | 130215        | 12389              | 17.83%         |

Key Findings:

| Source     | Clicks | CVR (%) | Funnel Quality Insight   |
|------------|--------|---------|--|
| YouTube    | 25,252 | 17.93%  | ⚠️ Strong traffic, but <b>spring_sale</b> campaign is weak (11.1%)                                     |
| Google     | 23,090 | 18.48%  | ⚠️ High traffic, but <b>spring_sale</b> & <b>black_friday</b> drop below 12%                           |
| LinkedIn   | 22,622 | 18.25%  | ✅ Good balance, though <b>spring_sale</b> at 12.7% could improve                                       |
| Instagram  | 20,586 | 15.27%  | ⚠️ <b>Low overall CVR</b> , esp. <b>product_launch</b> (13.3%) and <b>new_user_acquisition</b> (12.2%) |
| Facebook   | 20,558 | 16.67%  | ⚠️ <b>product_launch</b> is underperforming (8.6%) despite decent clicks                               |
| Newsletter | 18,107 | 20.31%  | ✅ Best funnel: consistently high CVR across campaigns  |

Campaigns with Drop-Off (High Clicks, Low CVR):

| Source    | Campaign       | CVR   | Status           |
|-----------|----------------|-------|------------------|
| YouTube   | spring_sale    | 11.1% | ❌ Needs UX fix   |
| Google    | spring_sale    | 10.7% | ❌ Drop-off       |
| Instagram | product_launch | 13.3% | ⚠️ Weak          |
| Facebook  | product_launch | 8.6%  | ❌ Major drop-off |

## Business Takeaways:

- **Newsletter performs best** in driving quality traffic.
- **Facebook and Instagram's product\_launch campaigns need landing page audits** — likely not aligned with user intent.
- Consider **A/B testing for spring\_sale creatives**, especially across Google & YouTube.

## 5. Keyword Intent Grouping (Semantic Clusters)

This step uncovers how **user intent** influences campaign performance and helps with smarter bidding and messaging.

### Question:

Do intent-based keyword clusters perform differently?

### How:

- Group **utm\_term** into buckets: e.g., "purchase intent" (**buy**, **deal**, **discount**) vs. "exploratory" (**info**, **guide**)
- Compare RPC, CVR

### Business Use:

- Optimize keyword bidding based on user intent

| Row Labels         | Sum of clicks | Sum of conversions | Sum of revenue   | Average of cvr | Average of rpc |
|--------------------|---------------|--------------------|------------------|----------------|----------------|
| exploratory        | 154617        | 15082              | 308044.97        | 19.54%         | \$3.78         |
| purchase_intent    | 147301        | 14723              | 271886.29        | 19.63%         | \$3.63         |
| <b>Grand Total</b> | <b>301918</b> | <b>29805</b>       | <b>579931.26</b> | <b>19.58%</b>  | <b>\$3.71</b>  |

## Insights:

- **CVR is slightly higher** for purchase-intent keywords — showing these users are more likely to convert.
- **RPC (Revenue per Click) is higher for exploratory terms**, likely because of **higher product value** (e.g., *shoes, bags*) rather than quick-action items like *discount*.
- **Both clusters perform almost equally well**, but:
  - *Exploratory users may need more nurturing but generate more revenue per visit.*
  - *Purchase-intent users are conversion-ready — ideal for retargeting or promotional campaigns.*

## Business Recommendation:

- **Use purchase intent keywords in bottom-of-funnel ads** (maximize CVR).
- **Use exploratory terms in awareness or middle-funnel ads**, upsell higher-value products.
- **Split testing landing pages or CTAs** could further amplify both groups' performance.

## Conclusion

This UTM-based marketing analysis project explored campaign performance through the lens of standardized tracking, behavioral segmentation, and funnel effectiveness. By cleaning and enriching over 1,500 rows of simulated UTM data, we built a layered understanding of how different sources, mediums, creatives, and keywords impact user engagement and ROI.