



First- and Last-Touch Attribution with CoolTShirts.com

Learn SQL from Scratch

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February 5, 2019

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1. Current CoolTShirts online marketing campaigns

1.1 Current Online Strategy

CoolTShirts (CTS) draws users to CoolTShirts.com through 8 online campaigns deployed through 6 sources.

The effectiveness of each can be tracked and measured through links containing Urchin Tracking Module (UTM) parameters.

- Campaigns include links in news articles, CTS' weekly newsletter, targeted email, Facebook ads, and Google searches.
- News article campaigns are most effective for initial user visits ("first-touch").
- Email and Facebook ads are most effective in drawing users back to the site to complete their purchase (the last point of contact with CTS' site is referred to as "last-touch").

8 Campaigns

Campaigns
getting-to-know-cool-tshirts
weekly-newsletter
ten-crazy-cool-tshirts-facts
retargetting-campaign
retargetting-ad
interview-with-cool-tshirts-founder
paid-search
cool-tshirts-search

6 Sources

Sources
nytimes
email
buzzfeed
facebook
medium
google

Deployment Strategy

Source	Campaign
nytimes	getting-to-know-cool-tshirts
email	weekly-newsletter
buzzfeed	ten-crazy-cool-tshirts-facts
email	retargetting-campaign
facebook	retargetting-ad
medium	interview-with-cool-tshirts-founder
google	paid-search
google	cool-tshirts-search

1.2 Collecting UTM parameter data

For our analysis, we have used data from CTS' page_visits data table.

- The first two queries to the right were used to confirm the count of distinct campaigns and sources in place.
- The third query identified the relationship between campaigns and the source used to deploy them.
- The page_visits table includes data for 1,979 unique users.
- UTM parameters were used to identify users' first- and last-touchpoints in order to evaluate campaign effectiveness.

```
SELECT COUNT(DISTINCT utm_campaign)
FROM page_visits;
```

```
SELECT COUNT(DISTINCT utm_source)
FROM page_visits;
```

```
SELECT DISTINCT utm_source,
                utm_campaign
FROM page_visits;
```

Campaigns	Sources	Source → Campaign
getting-to-know-cool-tshirts	nytimes	nytimes --> getting-to-know-cool-tshirts
weekly-newsletter	email	email --> weekly-newsletter
ten-crazy-cool-tshirts-facts	buzzfeed	buzzfeed --> ten-crazy-cool-tshirts-facts
retargetting-campaign	facebook	email --> retargetting-campaign
retargetting-ad	medium	facebook --> retargetting-ad
interview-with-cool-tshirts-founder	google	medium --> interview-with-cool-tshirts-founder
paid-search		google --> paid-search
cool-tshirts-search		google --> cool-tshirts-search

1.3 Importance of Attributing First- and Last- Touch

A successful marketing strategy requires a combination of first- and last- touch oriented campaigns.

- Of CTS' 1,979 users, 361, or 18%, went on to make a final purchase.

CTS page	Unique User Hits
1 - landing_page	1979
2 - shopping_cart	1881
3 - checkout	1431
4 - purchase	361

```
SELECT page_name AS 'CTS page',  
       COUNT(DISTINCT user_id) AS  
       'Unique User Hits'  
FROM page_visits  
GROUP BY page_name;
```

- Of the 361, only 25, or 7%, made a purchase on a single visit, where first- and last- touch were the same.

Journey_Type	Single_Campaign			
Count of User				
First_Source	First_Campaign	Last_Source	Last_Campaign	Total
nytimes	getting-to-know-cool-tshirts	nytimes	getting-to-know-cool-tshirts	8
buzzfeed	ten-crazy-cool-tshirts-facts	buzzfeed	ten-crazy-cool-tshirts-facts	8
medium	interview-with-cool-tshirts-founder	medium	interview-with-cool-tshirts-founder	7
google	cool-tshirts-search	google	cool-tshirts-search	2
Grand Total				25

With SQL to aid our analysis, the user, UTM parameter, and timestamp data from the page_visits table can be used to attribute first- and last- touch to the responsible sources and campaign, allowing us to identify the most effective combination.

2. The CoolTShirts.com user journey

2.1 User journey - CoolTShirts.com Site Structure

The CTS website consists of four main pages. First-touch is almost invariably initiated on the Landing Page. Last-touch on the Purchase page indicates that a final purchase has been confirmed.

Once on the site, a user's journey typically flows as follows:

1. Landing Page
2. Shopping Cart
3. Checkout
4. Purchase

However, the user's journey can be interrupted at any point, on any page – leading to the need for retargeting campaigns to draw the user back to CTS' site to complete their purchase.

```
SELECT DISTINCT page_name  
FROM page_visits;
```


2.2 User journey – First-touch attribution

Using the query to the right, we can identify each user's first-touchpoint and attribute it to one of the current campaigns.

Source	Campaign	# First Touches	% of First Touches
medium	interview-with-cool-tshirts-founder	622	31%
nytimes	getting-to-know-cool-tshirts	612	31%
buzzfeed	ten-crazy-cool-tshirts-facts	576	29%
google	cool-tshirts-search	169	9%
Total		1,979	100%

Garnering 91% of first-touchpoints, links in news articles are clearly the most effective campaigns for initiating user contact.

```
WITH first_touch AS (  
    SELECT user_id,  
           MIN(timestamp) as first_touch_at  
    FROM page_visits  
    GROUP BY user_id),  
ft_attr AS (  
    SELECT ft.user_id,  
           ft.first_touch_at,  
           pv.utm_source,  
           pv.utm_campaign  
    FROM first_touch ft  
    JOIN page_visits pv  
      ON ft.user_id = pv.user_id  
      AND ft.first_touch_at = pv.timestamp  
    )  
SELECT ft_attr.utm_source AS 'First_Source',  
       ft_attr.utm_campaign AS 'First_Campaign',  
       COUNT(*) AS 'First_Touches'  
FROM ft_attr  
GROUP BY 1,2  
ORDER BY 3 DESC;
```

2.3 User journey – Last-touch attribution

Similarly, using the query to the right, we can identify each user's last-touchpoint and attribute it to one of the campaigns.

Last_Source	Last_Campaign	# Last Touches	% of Last Touches
email	weekly-newsletter	447	23%
facebook	retargeting-ad	443	22%
email	retargeting-campaign	245	12%
nytimes	getting-to-know-cool-tshirts	232	12%
buzzfeed	ten-crazy-cool-tshirts-facts	190	10%
medium	interview-with-cool-tshirts-founder	184	9%
google	paid-search	178	9%
google	cool-tshirts-search	60	3%
Total		1,979	100%

A few things to note about last-touch:

- In some instances, last-touchpoint is the same as first-touchpoint (user likely made one visit to CTS site).
- In the cases of retargeting campaigns (email, Facebook), last-touch represents a return visit. As 57% of last-touch is attributed to these, the need for campaigns focused on generating return visits is apparent.
- Last-touch does not indicate a purchase – we must further qualify users' last-touch to determine this.

```
WITH last_touch AS (  
    SELECT user_id,  
           MAX(timestamp) as last_touch_at  
    FROM page_visits  
    GROUP BY user_id),  
lt_attr AS (  
    SELECT lt.user_id,  
           lt.last_touch_at,  
           pv.utm_source,  
           pv.utm_campaign  
    FROM last_touch lt  
    JOIN page_visits pv  
      ON lt.user_id = pv.user_id  
      AND lt.last_touch_at = pv.timestamp  
    )  
SELECT lt_attr.utm_source AS 'Last_Source',  
       lt_attr.utm_campaign AS 'Last_Campaign',  
       COUNT(*) AS 'Last_Touches'  
FROM lt_attr  
GROUP BY 1,2  
ORDER BY 3 DESC;
```

2.4 User journey – Purchase confirmed!

By augmenting the previous query by specifying the Purchase page in our criteria, we can limit last-touch results to users who actually made a purchase.

Last_Source	Last_Campaign	# Last Touches Resulting in Purchase	% Last Touches Resulting in Purchase
email	weekly-newsletter	115	32%
facebook	retargetting-ad	113	31%
email	retargetting-campaign	54	15%
google	paid-search	52	14%
buzzfeed	ten-crazy-cool-tshirts-facts	9	2%
nytimes	getting-to-know-cool-tshirts	9	2%
medium	interview-with-cool-tshirts-founder	7	2%
google	cool-tshirts-search	2	1%
Total		361	100%

- Making up 78% of the last-touch results that led to purchase, the importance of the email and Facebook campaigns is even more apparent.

```
WITH last_touch AS (  
  SELECT user_id,  
         MAX(timestamp) AS last_touch_at  
  FROM page_visits  
  WHERE page_name = '4 - purchase'  
  GROUP BY user_id),  
lt_attr AS (  
  SELECT lt.user_id,  
         lt.last_touch_at,  
         pv.utm_source,  
         pv.utm_campaign  
  FROM last_touch lt  
  JOIN page_visits pv  
    ON lt.user_id = pv.user_id  
    AND lt.last_touch_at = pv.timestamp  
  )  
SELECT lt_attr.utm_source AS 'Last_Source',  
       lt_attr.utm_campaign AS 'Last_Campaign',  
       COUNT(*) AS 'Last_Touches'  
FROM lt_attr  
GROUP BY 1,2  
ORDER BY 3 DESC;
```

2.5 User journey – first- and last- touch together

The first- and last- touch queries can be combined into a larger query to give us further insight to how users interact with CTS campaigns.

```
WITH first_UTM_campaign AS
(
  WITH first_touch AS (
    SELECT user_id,
           MIN(timestamp) as first_touch_at
    FROM page_visits
    GROUP BY user_id)
  SELECT ft.user_id,
         ft.first_touch_at,
         pv.utm_source,
         pv.utm_campaign
  FROM first_touch ft
  JOIN page_visits pv
    ON ft.user_id = pv.user_id
   AND ft.first_touch_at = pv.timestamp),
last_UTM_campaign AS
(
  WITH last_touch AS (
    SELECT user_id,
           MAX(timestamp) as last_touch_at
    FROM page_visits
    WHERE page_name = '4 - purchase'
    GROUP BY user_id)
/*continued in next shaded box*/
```

```
/*continued from previous box*/
SELECT lt.user_id,
       lt.last_touch_at,
       pv2.utm_source,
       pv2.utm_campaign
FROM last_touch lt
  JOIN page_visits pv2
    ON lt.user_id = pv2.user_id
   AND lt.last_touch_at = pv2.timestamp)
SELECT lc.user_id AS User,
       fc.utm_source AS First_Source,
       fc.utm_campaign AS First_Campaign,
       fc.first_touch_at AS First_Touch_At,
       lc.utm_source AS Last_Source,
       lc.utm_campaign AS Last_Campaign,
       lc.last_touch_at AS Last_Touch_At,
       CASE WHEN fc.utm_campaign = lc.utm_campaign
            THEN 'Single_Campaign'
            ELSE 'Multiple_Campaign'
       END AS Journey_Type
FROM last_UTM_campaign lc
  JOIN first_UTM_campaign fc
    ON lc.user_id = fc.user_id
;
```

2.6 User Journey – first- and last- touch together (continued)

The data from the query in 2.5 can be analyzed in a pivot table to show the user paths from first-touchpoint source to the last-touchpoint campaign attributed with a purchase.

- The best performing campaigns for first-touch are apparent, but further evaluation is needed for last-touch performance.
- The CASE statement in query 2.5 buckets user journeys as either “Single Campaign” or “Multiple Campaign” journeys.

Journey_Type		(All)			<-- (All) indicates Single and Multiple Campaign journeys	
Count of User						
First_Source	First_Campaign	Last_Source	Last_Campaign	Total		
medium	interview-with-cool-tshirts-founder	email	weekly-newsletter	37		
			retargetting-campaign	17		
		facebook	retargetting-ad	38		
		google	paid-search	19		
		medium	interview-with-cool-tshirts-founder	7		
medium Total				118		
buzzfeed	ten-crazy-cool-tshirts-facts	email	weekly-newsletter	36		
			retargetting-campaign	13		
		facebook	retargetting-ad	35		
		google	paid-search	16		
		buzzfeed	ten-crazy-cool-tshirts-facts	8		
		nytimes	getting-to-know-cool-tshirts	1		
buzzfeed Total				109		
nytimes	getting-to-know-cool-tshirts	email	weekly-newsletter	29		
			retargetting-campaign	18		
		facebook	retargetting-ad	35		
		google	paid-search	12		
		nytimes	getting-to-know-cool-tshirts	8		
		buzzfeed	ten-crazy-cool-tshirts-facts	1		
nytimes Total				103		
google	cool-tshirts-search	email	weekly-newsletter	13		
			retargetting-campaign	6		
		google	paid-search	5		
			cool-tshirts-search	2		
		facebook	retargetting-ad	5		
google Total				31		
Grand Total				361		

2.7 Single versus multiple campaign journeys

Isolating the Multiple Campaign user journeys will help us optimize CTS' campaign strategy.

Journey_Type Single_Campaign				
Count of User				
First_Source	First_Campaign	Last_Source	Last_Campaign	Total
nytimes	getting-to-know-cool-tshirts	nytimes	getting-to-know-cool-tshirts	8
buzzfeed	ten-crazy-cool-tshirts-facts	buzzfeed	ten-crazy-cool-tshirts-facts	8
medium	interview-with-cool-tshirts-founder	medium	interview-with-cool-tshirts-founder	7
google	cool-tshirts-search	google	cool-tshirts-search	2
Grand Total				25

Journey_Type		Multiple_Campaign		
Count of User				
First_Source	First_Campaign	Last_Source	Last_Campaign	Total
medium	interview-with-cool-tshirts-founder	email	weekly-newsletter	37
			retargetting-campaign	17
		facebook	retargetting-ad	38
		google	paid-search	19
medium Total				111
buzzfeed	ten-crazy-cool-tshirts-facts	email	weekly-newsletter	36
			retargetting-campaign	13
		facebook	retargetting-ad	35
		google	paid-search	16
		nytimes	getting-to-know-cool-tshirts	1
buzzfeed Total				101
nytimes	getting-to-know-cool-tshirts	email	weekly-newsletter	29
			retargetting-campaign	18
		facebook	retargetting-ad	35
		google	paid-search	12
		buzzfeed	ten-crazy-cool-tshirts-facts	1
nytimes Total				95
google	cool-tshirts-search	email	weekly-newsletter	13
			retargetting-campaign	6
		google	paid-search	5
		facebook	retargetting-ad	5
google Total				29
Grand Total				336

3. Optimizing the campaign budget

3.1 Optimization - Overview

- **CTS can only re-invest in 5 campaigns.**
- **The optimal strategy will consist of both first- and last- touch focused campaigns.**
- **Emphasis should be given to campaigns yielding the highest volume of purchases.**

3.2 Optimization – First-touch campaigns

Journey_Type		(All) <-- (All) indicates Single and Multiple Campaign journeys			
Count of User					
First_Source	First_Campaign	Last_Source	Last_Campaign	Total	% of Purchases
medium	interview-with-cool-tshirts-founder	email	weekly-newsletter	37	10%
			retargetting-campaign	17	5%
		facebook	retargetting-ad	38	11%
		google	paid-search	19	5%
		medium	interview-with-cool-tshirts-founder	7	2%
medium Total				118	33%
buzzfeed	ten-crazy-cool-tshirts-facts	email	weekly-newsletter	36	10%
			retargetting-campaign	13	4%
		facebook	retargetting-ad	35	10%
		google	paid-search	16	4%
		buzzfeed	ten-crazy-cool-tshirts-facts	8	2%
		nytimes	getting-to-know-cool-tshirts	1	0%
buzzfeed Total				109	30%
nytimes	getting-to-know-cool-tshirts	email	weekly-newsletter	29	8%
			retargetting-campaign	18	5%
		facebook	retargetting-ad	35	10%
		google	paid-search	12	3%
		nytimes	getting-to-know-cool-tshirts	8	2%
		buzzfeed	ten-crazy-cool-tshirts-facts	1	0%
nytimes Total				103	29%
google	cool-tshirts-search	email	weekly-newsletter	13	4%
			retargetting-campaign	6	2%
		google	paid-search	5	1%
			cool-tshirts-search	2	1%
		facebook	retargetting-ad	5	1%
google Total				31	9%
Grand Total				361	100%

In addition to making up 91% of total first-touch activity, links from the three news article campaigns make up 91% of first-touches that led to a final purchase, and 6% of last-touches.

News article campaigns are essential to driving initial traffic to CoolTShirts.com, and even generate some purchases.

3.3 Optimization – Last-touch campaigns

Journey_Type		Multiple_Campaign			
Count of User					
First_Source	First_Campaign	Last_Source	Last_Campaign	Total	% of Purchases
medium	interview-with-cool-tshirts-founder	email	weekly-newsletter	37	11%
			retargetting-campaign	17	5%
		facebook	retargetting-ad	38	11%
		google	paid-search	19	6%
medium Total				111	33%
buzzfeed	ten-crazy-cool-tshirts-facts	email	weekly-newsletter	36	11%
			retargetting-campaign	13	4%
		facebook	retargetting-ad	35	10%
		google	paid-search	16	5%
		nytimes	getting-to-know-cool-tshirts	1	0%
buzzfeed Total				101	30%
nytimes	getting-to-know-cool-tshirts	email	weekly-newsletter	29	9%
			retargetting-campaign	18	5%
		facebook	retargetting-ad	35	10%
		google	paid-search	12	4%
		buzzfeed	ten-crazy-cool-tshirts-facts	1	0%
nytimes Total				95	28%
google	cool-tshirts-search	email	weekly-newsletter	13	4%
			retargetting-campaign	6	2%
		google	paid-search	5	1%
		facebook	retargetting-ad	5	1%
google Total				29	9%
Grand Total				336	100%

Limiting our analysis to Multiple Campaign journeys, and the three news articles as the source of first-touch, the top performing campaigns for driving last-touch that resulted in purchase were:

- 1) Facebook retargeting ad (32% of total), and
- 2) 2) weekly email newsletter (30%).

Note: Substituting the next best performing last-touch campaign (retargeting email) for the lowest performing first-touch campaign (NY Times) does not yield better results.

3.4 Optimization – Recommendation

Based on our analysis of the user and UTM parameter data from the page_visits table, we recommend re-investing in the following 5 campaigns:

- **Medium** article "interview-with-cool-tshirts-founder" (first-touch focused)
- **Buzzfeed** article "ten-crazy-cool-tshirts-facts" (first-touch focused)
- **New York Times** article "getting-to-know-cool-tshirts" (first-touch focused)
- Facebook retargeting ad (last-touch focused)
- Weekly email newsletter (last-touch focused)