The Attribution Problem

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Why companies need Attribution of their Digital Spends

Attribution solves for a quantifiable connection between our efforts to reach our customers and the success of those efforts.
The Initial Question

If I have $XXX to spend in DG...
... where do I invest?
Attribution models widely used

Which marketing channels would help beat competition, reach & convert new or prospective customers?

Closer and influencer programs get no attributed credit

Which is the marketing channel just before user completed the order?

Starter and influencer programs get no attributed credit

First Touch

Last Touch
Other Approaches towards Attribution

**Business Question:**
Besides the first and last interactions, which marketing channels contribute equally to the final conversion?

**Business Question:**
Which marketing channels are mostly used during first & last touchpoints of the conversion?

**Business Question:**
If the business focuses on marketing channels that help close the conversion, which are the top marketing channels to invest?
On Day 1, our customer clicks on a display ad for ThinkPad. He browses a bit onsite, adds to cart, but he doesn’t order anything.

On Day 4, he comes to the site on his own, and finishes his research.

On Day 9, he opens an email ad and clicks through to use the 10% off ThinkPad e-coupon. The same day, he applies the coupon and completes his purchase!

Customer Journey Path

The problem – None is derived from the actual “Customer Journey”
The Problem – Doesn’t provide optimal investment scenario for max ROI

Display

Direct

Email

Purchase Value

More credit?
Less credit?

More credit?
Less credit?

More credit?
Less credit?
Who did the better job? – The soccer analogy
Solving the Business Need

What are the criteria for a good attribution system?
- Equal or concentrated?
- Statistical or heuristic?

Which methodology ascertains the correct value attribution?
- Business owner input
- Tests and experiments early in adoption

How should budgets be optimally allocated?
- Marketing Mix Optimization
- Budget Simulation
A New Approach – Fractional Attribution based on Probability

The Markov Chain
Why Markov Chains for Attribution?

The probability of touchpoints occurring help us compute the importance of those touchpoint to conversion.
If our example resulted in $1,800 sale, how much of that $1,800 sale should be attributed to Display?

1. First, compute the probability of success with Display

0.025 + 0.025 = 0.05

2. Next, compute the probability of success without Display

0.025

3. Compute the ‘Removal Effect’ RE = 0.025/0.05 = 0.5

Display gets 50% of the allocation for the $1,800 order, or $900.
Why Markov Chains for Attribution?

Markov Chains allow us to measure the impact of individual programs with the ‘Removal Effect’.

This allows us inferring true value of channels

Removal effects allow us to assess credit based on quality of each channel.
Markov-Based Attribution is a Big Data Problem

How Data is Transformed Through the Pipeline

Raw Clickstream

Customer Journey

Markov Model

Dashboard Results
Customer Journey Data Pipeline Architecture

Lenovo Data Infrastructure

Visitor

Raw Customer Journey Data

Customer Data Store → Markov Models (R) → Model Store

ID Graph

Enterprise Data Warehouse (EDW)

Products | Campaigns

Redshift

Results

Dashboard

Media Mix

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Do customer journeys vary?
How effective is each marketing channel?
What Price Band and Channel combo in Product Categories drive better ROI?
What’s Next

- Seasonality and What if Forecasting
- Diminishing Return Curve
- Media Mix Optimization
Thanks.
RATE TODAY’S SESSION

We’re living in a new era of constant sabotage, misinformation, and fear, in which everyone is a target, and you’re often the collateral damage in a growing conflict among states. From crippling infrastructure to sowing discord and doubt, cyber is now the weapon of choice for democracies, dictators, and terrorists.

David Sanger explains how the rise of cyberweapons has transformed geopolitics like nothing since the invention of the atomic bomb. Moving from the White House Situation Room to the dens of Chinese, Russian, North Korean, and Iranian hackers to the boardrooms of Silicon Valley, David reveals a world coming face-to-face with the perils of technological revolution—a conflict that the United States helped start when it began using cyberweapons against Iranian nuclear plants and North Korean missile launches. But now we find ourselves in a conflict we’re uncertain how to control, as our adversaries exploit vulnerabilities in our hyperconnected nation and we struggle to figure out how to deter these complex, short-of-war attacks.

David Sanger
The New York Times

David E. Sanger is the national security correspondent for The New York Times as well as a national security and political contributor for CNN and a frequent guest on CBS This Morning, Face the Nation, and many PBS shows.