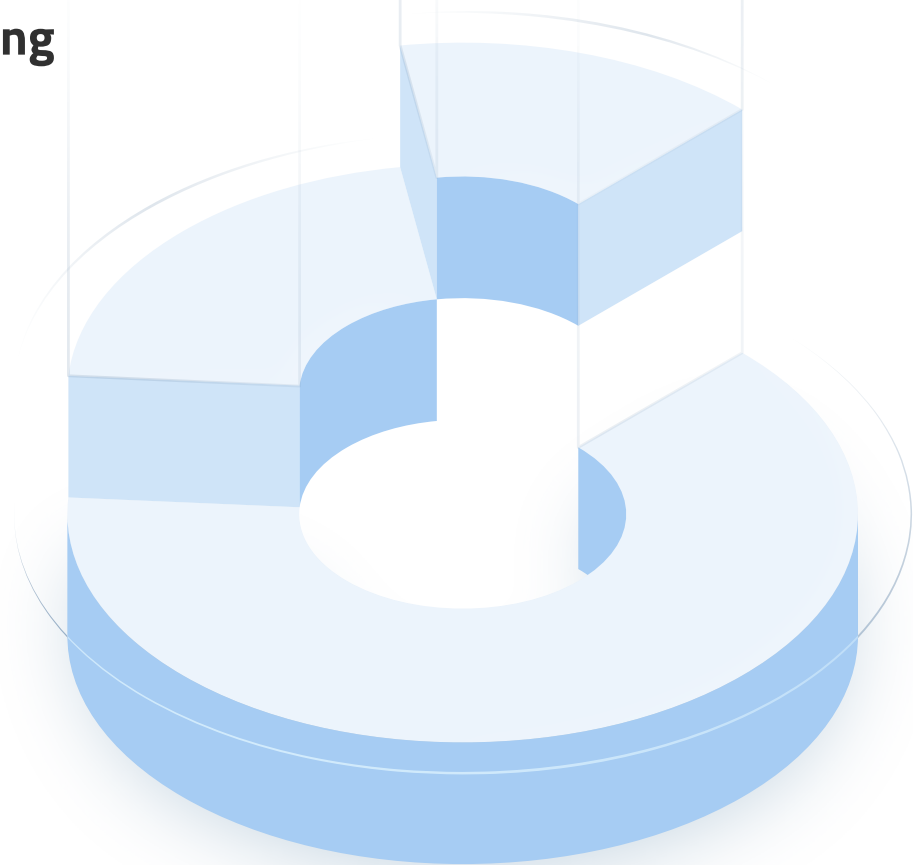




Multichannel Marketing Attribution with DataRobot

Executive Briefing





About the Author: Colin Priest

Based in Singapore, Colin is the Director, Customer Success and Lead Data Scientist, APAC for DataRobot, where he advises businesses on how to build business cases and successfully manage data science projects. Colin built his first machine learning model for marketing more than 20 years ago, when he needed to predict how sales would react to changes in product placement and pricing versus competitors. Over the years since he has continued to bring scientific rigor to marketing, helping businesses to find the most effective way to engage with their customers to boost sales. Over his career, Colin has held a number of CEO and general management roles, where he has championed data science initiatives in financial services, healthcare, security, oil and gas, and government. He frequently speaks at conferences around the globe. Colin is a firm believer in data-based decision making and applying AI. He is passionate about the science of healthcare and does pro-bono work to support cancer research.



Introduction

Companies are spending more than ever on marketing. By 2019, according to the Harvard Business Review, it's estimated that global spending on media is expected to reach \$2.1 trillion. But is all that money effective in producing improved ROI? Without knowing which channels are driving sales, or more specifically, which individual efforts are working, marketing spending is like a black box.

Fact is, despite the substantial amount of capital involved, few businesses are measuring the cost versus benefit of their specific marketing activities. While measuring marketing costs is relatively easy, quantifying the output of those costs has traditionally been difficult.

In today's world of digital commerce it is not uncommon for a transaction to involve as many as thirty marketing activities, or "touchpoints." Spreading marketing activities across many channels increases the difficulty of determining the impact of each channel, how different channels interact, and which ones are truly driving sales. Many marketers take a convenient short cut and credit each sale to the last touchpoint before the sale. Attributing a sale to a single touchpoint paints a flawed and inaccurate picture of a customer's true "path to purchase."

To properly attribute the influence of all marketing activities, businesses need an enterprise-grade methodology capable of quantifying each touchpoint's impact on the sale.



Why Worry About Marketing Attribution?

Assuming that your marketing budget is not unlimited, you have to make decisions about where to allocate marketing dollars. You may know in aggregate that your marketing “is working,” but without true attribution, you don’t know which marketing activities have the greatest impact and which are simply eating into limited marketing budgets. Attribution allows you to:

Justify Marketing Budgets and Optimize Marketing Activities

Because marketing is a significant line item, CEOs and CFOs want justification for those expenses. With a proper attribution methodology in place, you can analyze individual touchpoints and campaigns to identify the marketing activities that deliver the best results, and move resources away from ineffective channels. Marketing attribution arms marketing managers with a detailed cost-benefit analysis for every marketing activity, promoting open and valuable discussion with sales and executive teams.

Make Smarter Bids for Digital Campaigns

Competition for impressions on today’s most popular websites is fierce, and cost-per-click (CPC) prices are rising across the board. Knowing how much you can spend on a CPC or cost-per-thousand-impressions (CPM) campaign for any channel or ad is crucial. By placing a fair value on every channel and type of advertising, proper attribution gives you a maximum allowable limit to guide your bidding strategy.

Effectively Measure Key Performance Indicators

Attribution creates an effective way to truly measure key performance indicators for each and every dollar spent. As a result, future marketing budgets are directed where they will have greatest impact.

Proper Attribution Solves Common Marketing Inefficiencies

As the saying goes, “you can’t improve what you don’t measure.” Marketing with little or no information and analysis leads to marketing dollars spent inefficiently and ineffectively. Proper marketing attribution solves at least four major challenges.

Problem: Cluster Analysis Can Result in Flawed Targeting

Until recently, marketing best practices dictated the use of cluster analysis, a statistical technique that assigns prospects and customers to groups, or clusters, based on characteristics that are common to individuals within that group. For example, a cluster might be based on demographics such as age, marital status, annual income, or market affinity.



While the goal of cluster analysis is to group consumers with similar traits into a target segment, in reality, each individual within a cluster is just that... an individual. Even though individuals may be grouped in the same cluster, they may be completely different when it comes to purchasing behavior.

Despite these obvious limitations, cluster analysis became popular because it was simple and practical to calculate clusters using commonly available software running on the computing power at the time. Basically, something was better than nothing. But as business has become more competitive, and individuals have become used to customization, cluster analysis is no longer adequate. Modern customers expect to be treated as individuals.

Problem: Attributing Sales to the Last Touchpoint is Flawed

Many companies use a range of marketing touchpoints to drive sales. As a result, a customer may have purchased a product after seeing an online advertisement, paid search result, direct mail, bill insert, TV advertisement, webinar, email, SMS, or any combination of these touchpoints.

Standard practice in the industry has been to attribute a sale to the most recent marketing touchpoint. But by creating brand awareness, earlier touchpoints may have had a significant impact on the consumer's decision to purchase. In fact, a consumer may have been going to purchase regardless of whether they saw the latest online ad or not.

In May 2016, Google admitted that [“last click attribution may not always tell the full story,”](#) and announced that it would give advertisers a broader range of attribution options. An industry leader like Google acknowledging that many touchpoints combine in a consumer's journey toward making a purchase provides clear direction to other marketers.

Problem: Separating the Effects of Multiple Touchpoints is Difficult

In today's digital world, the average sale results from more than 30 touchpoints. Without better predictive models, marketers simply don't know which activities were most effective in driving the purchase decision.

Problem: Knowing Which Ads Reached a Specific Consumer

In a perfect world, we would know exactly which customers saw a particular online or TV ad, but to date, this information has been difficult or impossible to come by.

The nature of digital marketing and media placements can often be at odds with data-minded marketing professionals. Views and clicks in the digital world are aggregated and anonymized, and television and print media only show broad demographic information about potential influence.




Marketers are forced to create landing pages with collection forms, which offers concrete information only on the visitors motivated to submit the form. But if the visitor doesn't complete the form, all you're left with are website analytics. These raw numbers don't provide the full impact of a particular ad in an integrated campaign with multiple touchpoints.

Marketing Attribution in the Age of Multiple Touchpoints



For most marketers, attribution is static: a lead comes in and you attribute it to either the first or last point of contact. As that lead progresses through the sales cycle, data is gathered on each touchpoint. When a purchase happens, the last touchpoint is credited with influencing the sale.

This approach is essentially saying that none of the earlier marketing touchpoints made any difference. Obviously this isn't realistic – otherwise marketing teams wouldn't have set up all of those other touchpoints.

	Email	SMS	Google Ad	
Customer A	✓			✓
Customer B	✓	✓		✓
Customer C		✓	✓	

Marketers need a way to analyze the journey that each prospect takes before purchasing. By collecting data, including customers' demographic information and their marketing touchpoints, such as online ads from Google or Facebook, website visits, webinar registrations, television commercials, live events and social media, analytics are used to identify patterns in behavior that predict the likelihood of a purchase. For example, Facebook ads may increase the probability of a purchase for younger prospects, while TV ads may work better for other demographics.

CustomerID	age	job	marital	education	housing	loan	facebook	googleAds	sms	CustomerID	purchase
C97839830	29	blue-collar	married	high.school	no	no	yes	no	no	C97839830	no
C88997162	46	admin.	married	high.school	yes	no	yes	yes	no	C88997162	yes
C93918389	39	technician	married	high.school	no	no	no	yes	no	C93918389	no
C41017587	36	admin.	single	university.degree	yes	no	yes	no	no	C41017587	yes
C3683542	37	self-employ	married	basic.9y	yes	yes	no	no	no	C3683542	no
C51787802	35	admin.	married	high.school	no	no	no	yes	no	C51787802	yes
C13595308	43	admin.	married	university.degree	no	no	no	yes	no	C13595308	no
C39285731	48	retired	married	basic.9y	no	no	no	no	no	C39285731	no



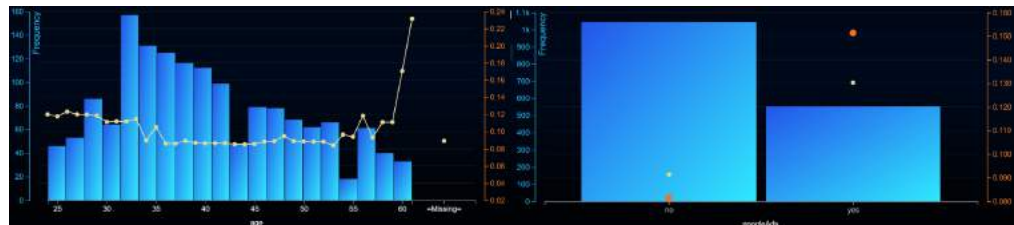
Machine Learning and Mapping the Path to Purchase

While data informs marketers of the consumer's paths to purchase, for effective marketing attribution, marketers need to develop highly accurate predictive models. Statistical methods, which add a score for each separate personal characteristic, are not up to the task of modelling complex human behavior. Many characteristics interact – a customer may like travel, but not like flying, for example – and the interaction effect is difficult to model using traditional statistical techniques.

Modern machine learning techniques are replacing statistical methods. Machine learning models capture and analyze the complexity of human behavior, analyze the impact of a large number of touchpoints, and identify which marketing activities most influence a sale. By learning from historical data, marketers can apply models to predict whether a new lead will convert into a paying customer.

Traditionally, data scientists build machine learning algorithms manually. This process can be frustratingly time consuming, with some projects taking months to deliver. By the time the algorithm is ready, it may already be obsolete.

Marketing needs a faster way to build the algorithms – a process that isn't so manual. The answer is automated machine learning, a technology that automatically constructs algorithms from historical data, sometimes in as little as a few hours instead of days or months.

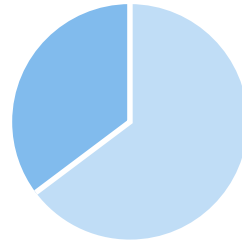


To accelerate and optimize the predictive modeling process, you need DataRobot.

Marketing Attribution and DataRobot

DataRobot offers an automated machine learning platform that empowers users of all skill levels – including marketers – to make better predictions faster. By automating many of the skills traditionally applied only by data scientists – programming in R or Python, developing algorithms, etc. – DataRobot provides the fastest path to data science success for users who understand the business and the data.

As such, DataRobot allows you to create sophisticated marketing attribution models to perform complex “what-if” analyses that quantify the effectiveness of different kinds of marketing activities and different combinations of marketing touchpoints. The end result is a complex predictive model that estimates the effect of each combination of marketing touchpoints on the customer base.



MARKETING ATTRIBUTION

- None i.e. Baseline Sales
- Marketing

Start with a Baseline

To begin, you need to determine a baseline – the sales that would naturally occur without any marketing activity. In other words, your baseline sales are those people who would purchase your products no matter what you do. Use DataRobot to analyze the impact on sales if you remove all of the marketing touchpoints.

Determine the Marketing Contribution to Sales

The total marketing contribution to sales is the difference between actual sales and the calculated baseline sales. The more effective your marketing activities, the more sales are boosted above this baseline.

Assign a Contribution for Each Touchpoint

The next step is to consider every touchpoint, and every combination of touchpoints, that occur on the customer’s path to purchase. DataRobot performs a variety of what-if calculations on the impact to sales if you remove one, or multiple, touchpoints. If a touchpoint is impactful, predicted sales will drop significantly. If a touchpoint is not adding value, predicted sales will hardly change. And, because some touchpoints need to work together to be effective, if you drop any one of the them, predicted sales will drop.

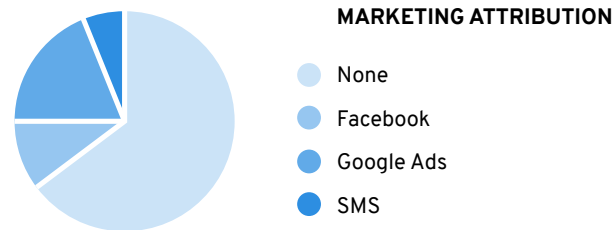
	Email	SMS	Google Ad	
Customer A				0.01
Customer B	✓			0.035
Customer C		✓		0.03
Customer D	✓	✓		0.04

By feeding DataRobot historical touchpoints and outcomes, the platform automatically finds patterns, creating a model that predicts sales depending upon the touchpoints that apply to each lead. Using the model, you will run a number of “what if” scenarios using different touchpoints to predict how different combinations of touchpoints impact sales.



Game Theory for Marketing Attribution

For attribution allocation to be fair and reasonable, marketers use a technique borrowed from game theory called the Shapley Value. This theory is a well-established economics concept used by businesses to determine how influential each touchpoint is to the final sale. The results of the different what-if scenario predictions are fed into the Shapley Value formula and used to calculate a fair value for each possible contributor. Neither the first, nor the last, touchpoint are given unfair extra consideration – each touchpoint must justify its individual contribution fairly and equally.



Attribution performed in this way “lights up” your sales funnel, giving you insights not possible only a few short years ago.

Attribution creates a clear guide to show you which marketing programs are worth spending money on, and which are not. With this information, you do more of what works, and reduce or eliminate what doesn't.

The Case for DataRobot

Marketing attribution requires complex predictive modeling, applied across millions of customers and dozens of marketing activities. This work requires powerful computers specialized to perform analytic workloads; [Moore's Law](#) and cloud computing have reduced the cost of such machines making them affordable to most marketers. An enterprise platform such as DataRobot, builds on this foundation. Machine learning models run the millions of what-if predictions required to accurately attribute marketing campaigns to sales. With DataRobot, marketers automatically create their own machine learning models, giving them the insights they need to spend budgets effectively and improve returns on investment.

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