



RESEARCH INITIATIVES

# EIGHT YEARS OF MARKETING ANALYTICS PROGRESS

KEY TRENDS AND DEVELOPMENTS AS  
SHOWCASED ON THE STAGE OF THE  
ATTRIBUTION & ANALYTICS ACCELERATOR

PRODUCED BY



SEQUENT  
Partners™

## About Sequent Partners

Sequent Partners is a leading consultancy in media, advertising and brand metrics and analytics. They are independent specialists in marketing mix and attribution modeling and have used their knowledge to design the program for the Attribution Accelerator for the past eight years. This unapologetically rigorous event is the only conference devoted entirely to attribution and modeling. It has accelerated the development of new technical approaches and creative methodological solutions for marketing performance measurement.

## About the Advertising Research Foundation

Founded in 1936, the [Advertising Research Foundation](#) (ARF) has emerged as the preeminent authority on unbiased quality in advertising, media and marketing research. With over 400 member companies, the ARF's powerful knowledge, unified standards and best practices have proven invaluable time and again. The ARF continues to drive continuous improvement in advertising and marketing practices by fostering collaboration and innovation, shaping the industry's future.

In today's rapidly changing technology landscape, the ARF remains committed to providing accurate information, setting industry standards and promoting transparency. For more information, visit [www.thearf.org](http://www.thearf.org) and also visit us on [LinkedIn](#), [YouTube](#), [X \(Twitter\)](#), and [Facebook](#).

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# INTRODUCTION

The past eight years have witnessed a head-spinning evolution in marketing analytics. Techniques, data and applications in use today were, at best, just visions eight years ago. The Attribution & Analytics Accelerator, an annual conference run by Sequent Partners and the ARF, has been at the center of this rapid acceleration. Proving true to its goal and name, the brand-centric case studies showcased at this essential event provide a comprehensive view of the important developments and innovations over the past several years. This report discusses the learnings accumulated over the eight years the conference has taken place.

*This meta-analysis is noting where we saw progress, when innovations first appeared on the industry's radar, and how big and sticky the innovations were.*

By analyzing case studies from marketers and their research partners, we identified nine key trends that have shaped the field of marketing analytics:

1. Increased complexity of modeling methods
2. Drive for integrated 360-degree models
3. Explosion of data and associated challenges
4. Rise of randomized controlled tests
5. Growth of machine learning and AI
6. Improved measurement of long-term and brand effects
7. Push for greater actionability and faster insights
8. Enhanced measurement of creative impact
9. Focus on organizational adoption

The interesting thing about this meta-analysis is noting where we saw progress, when innovations first appeared on the industry's radar, and how big and sticky the innovations were. Through time, we can also see the issues that came and went, and those that were never fully resolved and persisted over the years.

# TREND 1: INCREASED COMPLEXITY OF MODELING METHODS

Over the past eight years, there has been a clear progression toward more sophisticated and complex analytics methods in marketing. The field has moved beyond simplistic approaches like last-click attribution to incorporating more advanced techniques like Bayesian methods and complex, deep learning AI-based methods. We've seen the practice move from a digital attribution product in a digital silo to something more integrated across a broader range of media, marketing and marketplace drivers.

During 2016-2017, there was growing recognition of the limitations of the earliest attribution methods. Brand presentations highlighted issues like the “snake oil” of last-click attribution and estimated that it led to something like 54% misattribution of marketing impact. One study showed that 2/3 of the Top 1000 CMOs said they could not quantify marketing ROI in 2017. At the time, there was recognition that attribution was fraught with peril. Yet, the promise of individual level analytics was exciting and the industry had to solve it.

*The Accelerator has always been “unapologetically rigorous” and as a result, we have seen modeling techniques and approaches that begin to match the complexity of modern marketing – all from the marketer’s perspective.*

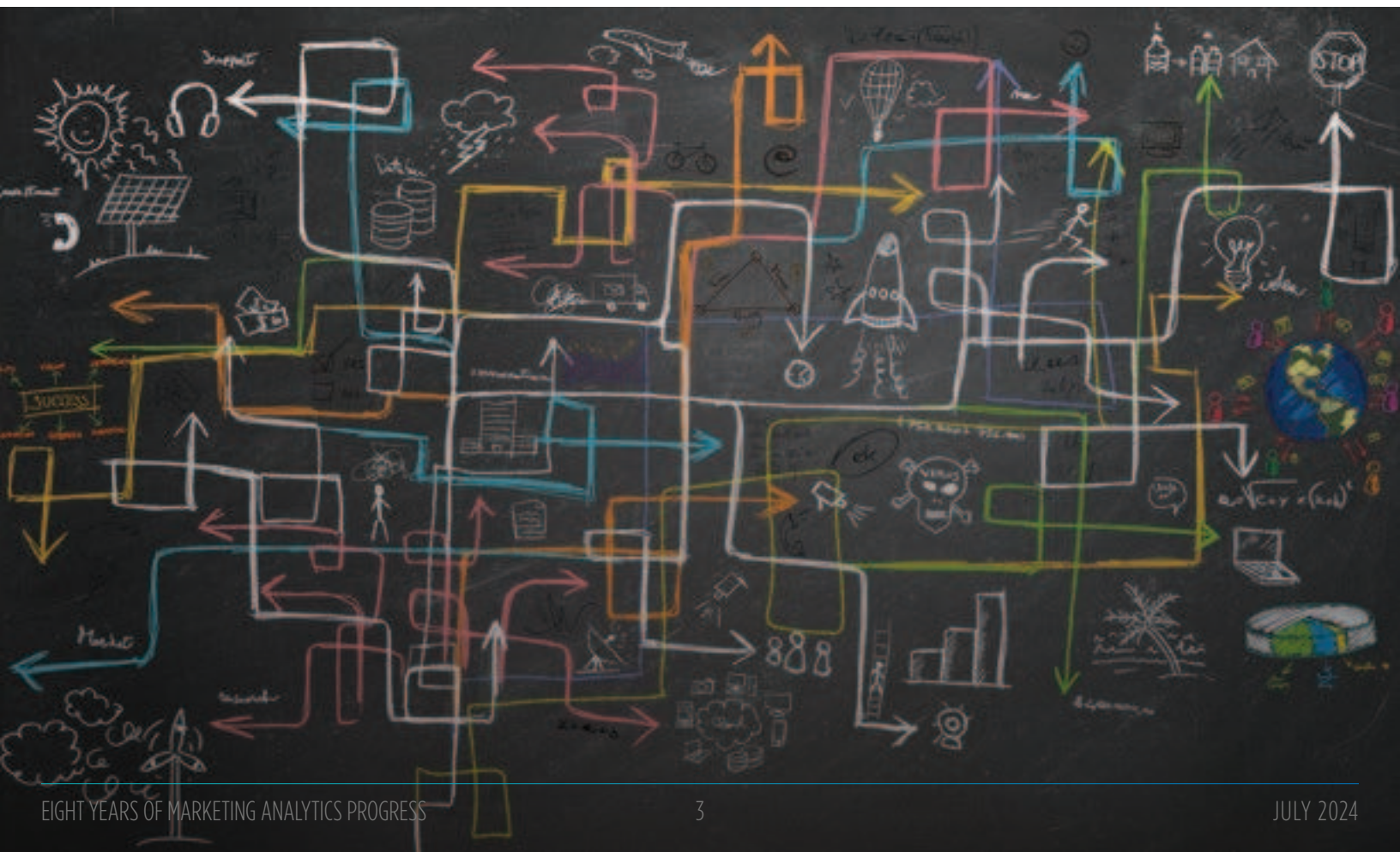
A year later, there was evidence that more complex methods like Markov chains were being applied to analyze digital paths to purchase. This was surprising – that was a pretty sophisticated technique for the times, when standard practice involved just looking at a cookie stack. This was a significant leap in sophistication. The analytics were accelerating.

A key question that emerged around 2018 was whether attribution was truly measuring incremental impact. Unlike marketing mix models, attribution studies typically lacked baselines to isolate brand momentum from incremental effects. And, since most attribution products analyzed the effects of a single publisher, they tended to misattribute the effects of all of the unmeasured drivers to the measured publisher. Both factors resulted in a large misattribution of sales and a concomitant recommendation to misallocate marketing funds.

This sparked an ongoing discussion about incrementality that has continued through recent years. The need for incrementality measurement was discussed as recently as 2021 and 2022. Surprisingly, analytics providers noted that incrementality was not particularly well understood by marketers. The industry is still wrestling with incrementality today, in measurement of retail media. Retail media, which intercepts people at the point of purchase, must acknowledge the mindset and marketing factors that brought them to the shelf in the first place and account for sales that would have occurred in the absence of retail media exposure.

On another front, around 2019, it became clear there was a “renaissance” of marketing mix modeling underway, with innovations that made those models more granular and tactical. For instance, one marketer discussed using zip code level data in mix models to gain more degrees of freedom and greater actionability for his highly localized brand. As attribution faced growing data challenges, which came to light as early as 2019, mix modeling evolved to fill some of the gaps by becoming more frequent and more granular.

We have seen modeling techniques and approaches that begin to match the complexity of modern marketing – all from the marketer’s perspective. We expect sophistication to continue to grow, with the rise of techniques leveraging machine learning and AI. We are a long way from the early simplistic digital attribution models.



## TREND 2: DRIVE FOR INTEGRATED 360-DEGREE MODELS

As the marketing landscape grew more fragmented and complex, there has been an increasing push for more holistic, 360-degree measurement approaches that integrate data across channels and consumer touchpoints. Digital media promised full trackability, replete with real-time reporting and marketers searched for those capabilities outside the digital realm to get a fuller view of the consumer/customer journey.

In the early days of attribution, measurement was often siloed and incomplete. A key focus from 2016-2017 was unifying digital and traditional media attribution. There were ongoing discussions about how to integrate measurement across an expanding set of media channels and platforms. Even within digital media itself, there were gaps to address. In 2017, brands highlighted the need to incorporate walled garden platforms into attribution models. Despite being digitally trackable, these important channels were excluded from integrated measurement.

Television measurement was another key area of focus, with multiple presentations in 2019-2020 addressing how to integrate linear TV, OTT and other video formats into holistic models. There were also efforts to bring in other sales channels like e-commerce and in-store retail. Beyond just media, there has been growing interest in incorporating other marketing drivers like influencers, salesforce performance or call centers, as well as external factors that impact response. For example, the presentation: “Missing Factors: The Economy and Seasonality in Attribution!” The goal has been to develop truly comprehensive models that account for all sales drivers.

This broadening of the modeling aperture is important to brands that need to optimize their allocations across all the marketing factors at their disposal and get the greatest payback from their marketing investments. While many important marketplace factors (i.e. season, weather, economy) are beyond marketers’ control, they need to understand their impact to invest marketing dollars where and when they will provide the greatest return on investment.

More recent presentations have showcased innovative approaches to create unified views across channels. For instance, some companies are using panel data alongside sales data to bridge online and offline behaviors. Clean room technologies are also enabling new forms of data integration. There has been some success in this area over time.

# TREND 3: EXPLOSION OF DATA AND ASSOCIATED CHALLENGES

The massive growth in available data has been both an opportunity and a challenge for marketing analytics. More granular, real-time data enables more precise measurement, but also creates significant data management hurdles. As early as 2016, presenters were highlighting the challenges of data sourcing, integration, cleaning, quality assurance and the time/effort required for data engineering. These fundamental data challenges have remained a consistent theme throughout the past eight years, if not longer.

The growth of first-party and location data opened up many new measurement possibilities. Interestingly, as early as 2016-2017 brands were exploring how to leverage these emerging data sources. But connecting data across walled gardens and integrating online/offline data remain perpetual struggles.

Privacy regulations and the deprecation of third-party cookies have created additional data challenges for analytics. Speakers as early as 2019 were discussing the potential impacts of GDPR, CCPA and the decline of the third-party cookie. These issues have forced ongoing and accelerated evolution in measurement approaches. Ironically, while Google has retreated from Chrome third-party cookie deprecation, the threat of sunseting cookies engendered several innovative solutions that might prove superior.

Some brands in recent years have speculated that attribution as a practice may be “dying” due to data limitations. That sentiment first appeared in 2022. The irony here is that when the Accelerator began in 2016, there was a strongly held belief that marketing mix models were dead! Other brands began showcasing innovative solutions leveraging clean rooms, panels and other approaches to overcome data restrictions. Clearly, data solutions like cohort-level or aggregated geographic attribution will continue to evolve as privacy regulations become more prevalent.

AI and machine learning are seen as potential solutions to help with data challenges, potentially automating aspects of data cleaning and integration. Even so, brands have cautioned that significant human oversight will always be required to ensure data quality and usability.



## TREND 4: RISE OF RANDOMIZED CONTROLLED TESTS

Randomized controlled tests (RCTs) have weaved their way through the years of the Attribution Accelerator. “Test and learns, A/B tests” have been a part of the marketing mix practice as a smart way to gain insight into a media/marketing channel that wasn’t used historically and not in the model.

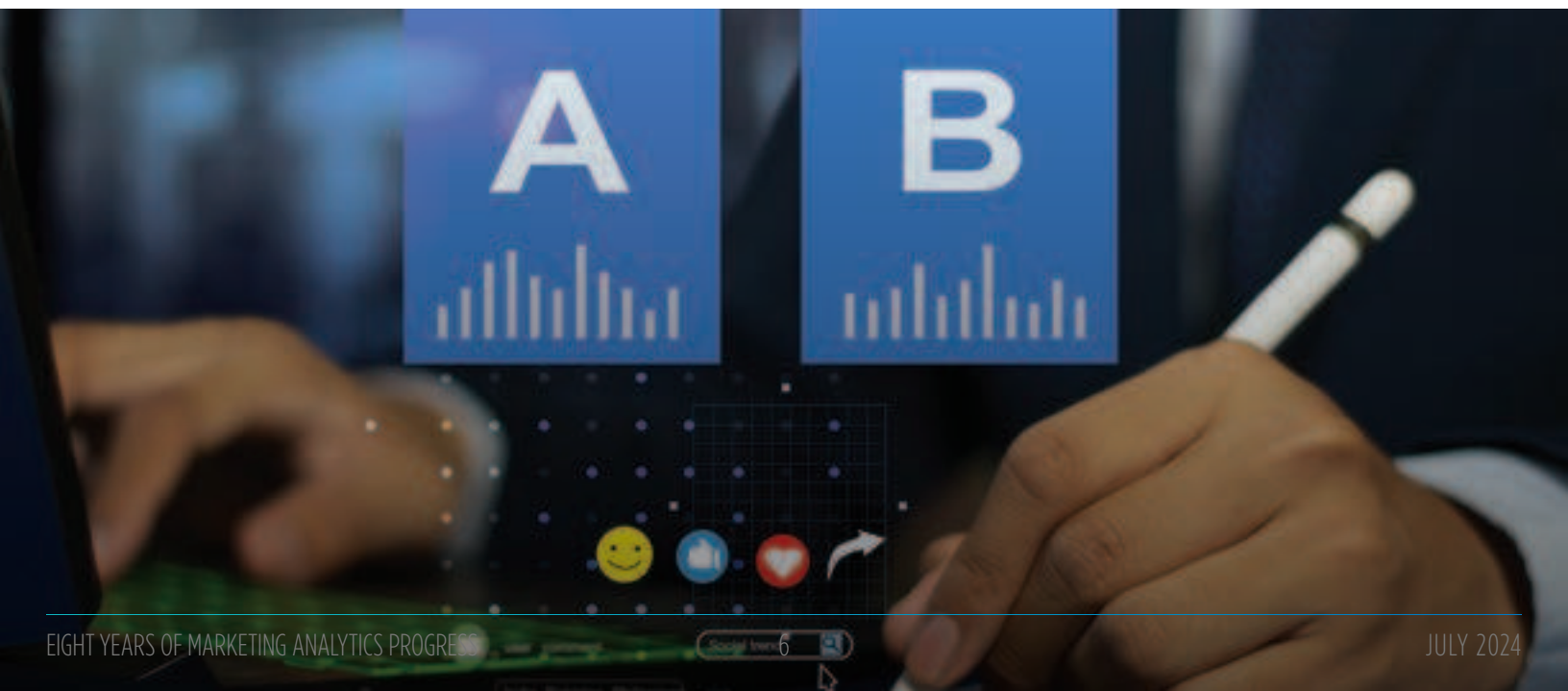
*Rather than seeing RCTs as a replacement for attribution or mix modeling, leading companies are using them as complementary tools within a broader measurement ecosystem.*

RCTs first appeared as a topic at the Attribution Accelerator in 2017. Brand presentations highlighted how these approaches could help isolate true incremental impact in ways that observational studies could not. Incrementality was one area where disillusionment with attribution had set in early. Other uses of RCT were identified such as bridging siloed platforms like Meta or Google. In 2019, RCTs were presented as just about the best way to gauge incrementality.

By 2021, there were discussions of how to run experimental tests at scale, moving beyond one-off experiments to more systematic testing programs. Some companies showcased how they were using rapid experimentation as part of ongoing optimization efforts.

More recent presentations have focused on how to integrate experimental results with other measurement approaches. Rather than seeing RCTs as a replacement for attribution or mix modeling, leading companies are using them as complementary tools within a broader measurement ecosystem.

Some limitations of RCTs have also been recognized, including challenges with running clean experiments in complex, multi-channel environments. But overall, controlled experimentation has become a core part of sophisticated marketing measurement approaches.





# TREND 5: GROWTH OF MACHINE LEARNING AND AI

Artificial intelligence and machine learning have had a growing impact on marketing analytics over the past several years. These techniques are being applied to enhance multiple aspects of measurement and optimization.

In the early days (around 2018), much of the focus was on using AI/ML to manage analytic heavy lifting – to automate data processing, speed analytic cycle times and enable faster and more frequent insights.

By 2020, presenters were showcasing more advanced applications using deep learning and other sophisticated ML techniques. AI expanded the scope and scale of analytic models. Some key applications that have emerged include:

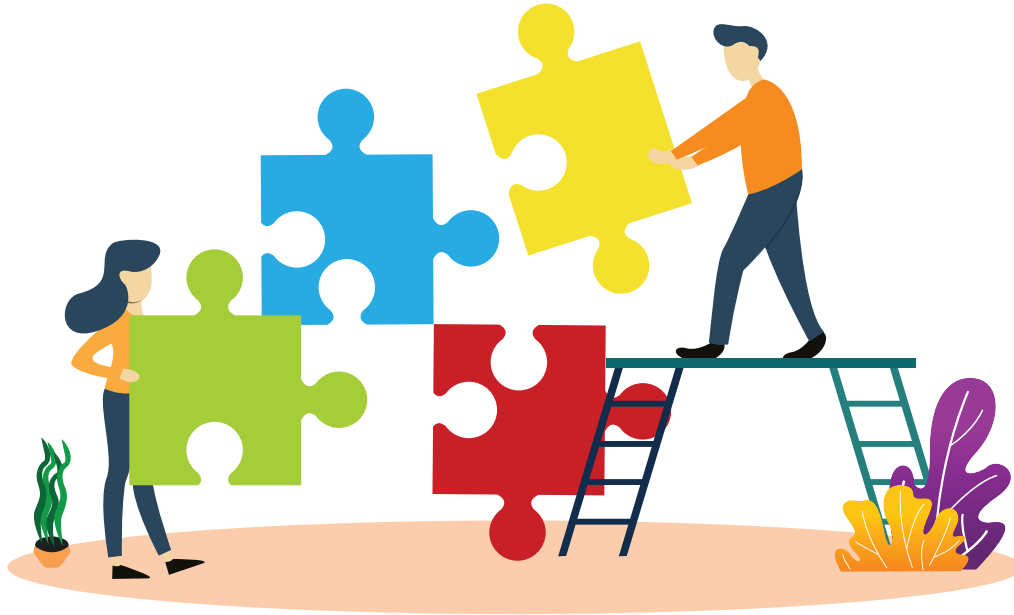
- Scenario planning and forecasting
- Audience segmentation and targeting
- Creative optimization and testing
- Anomaly detection in marketing/sales data
- Automated insight generation

Brands also highlighted how ML techniques can complement traditional statistical approaches. For instance, ML may be better suited than regression for capturing non-linear relationships or interactions between variables.

However, the interpretability of AI models remains an ongoing focus. Some companies have developed techniques to explain AI-driven marketing mix models in ways that are actionable for business users. Looking ahead, there is significant interest in how large language models and other emerging AI capabilities may impact marketing measurement and the dissemination of model insights. But brands recognize the need for human oversight and domain expertise in applying these tools effectively.



# TREND 6: IMPROVED MEASUREMENT OF LONG-TERM AND BRAND EFFECTS



A key theme over the past eight years has been the push to better measure and quantify long-term marketing impact and brand effects. This addresses a common criticism that attribution and short-term focused analytics ignore critical, long-term value creation.

In the early days of digital attribution, measurement was very focused on immediate online behaviors and conversions, or: “Stuck at the bottom of the funnel.” However, relatively soon after, we saw recognition of the need to incorporate upper-funnel metrics or brand health indicators. The issue was how to do it.

Presentations showcased various methods for bridging short-term and long-term measurement, including:

- How to integrate brand equity metrics into marketing mix models
- Development of multi-stage funnel models that connect brand measures to sales
- Adding customer lifetime value as a key performance metric
- Quantifying the revenue impact of improvements in brand metrics rather than conversions or sales

One notable example of how to integrate upper and lower funnel tactics (from 2023) was Microsoft’s work on calculating elasticities between “brand love” and revenue. They found that a one percent increase in brand love correlated to a 1.27% increase in revenue. This kind of quantification helps justify brand-building investments. There has also been more focus on balancing short-term performance marketing with long-term brand building. Another case study found an ideal mix of 70% performance with 30% brand building media to optimize both immediate sales and long-term growth.

# TREND 7: PUSH FOR GREATER ACTIONABILITY AND FASTER INSIGHTS

A consistent theme over the years has been the demand for more actionable and timely marketing analytics. Speed to insight. And an ongoing push to evolve to more real-time optimization capabilities.

In the early days of the Attribution Accelerator (2016-2017), a key topic was how to meld the speed and granularity of digital attribution with the comprehensiveness of marketing mix modeling. There was recognition that traditional MMM approaches were far too slow for the pace of digital marketing. By 2018-2019, brands were discussing capabilities for “almost real-time” measurement, with a focus on getting insights on last week’s performance to inform this week’s decisions. There was an early presentation showcasing how to use attribution insights to power programmatic bidding optimization (attribution on its own is too slow for that). More recent presentations have highlighted capabilities for true real-time or “always-on” measurement and optimization. This includes automatically adjusting media buys or creative rotations based on ongoing performance data.

However, real-time, cross-channel optimization remains challenging. Most examples of on-the-fly optimization tend to occur today within individual channels rather than holistically across the full marketing mix. Looking ahead, there is significant interest in how AI and machine learning can enable faster insights and more automated optimization. And yet, there is clear tension--the need to balance speed with accuracy and sound strategic thinking. The role of humans in the organizational structure and decision-making process, cannot be understated when it comes to capitalizing on fast-paced results. How companies respond to these new capabilities remains an open issue. One presentation at the Accelerator revealed that divisions in the same company actively competed in the programmatic bidding process due to an uncoordinated organizational structure.



## TREND 8: ENHANCED MEASUREMENT OF CREATIVE IMPACT

Improving the measurement and optimization of creative has been a key theme throughout the Attribution Accelerator's tenure. This addresses a long-standing gap in marketing analytics, where media impact was more easily quantified than creative performance. Early attribution and mix modeling approaches typically didn't isolate the impact of creative from

*Interest in how generative AI may impact both creative development and measurement. This could potentially allow for even more rapid testing and a greater optimization of ad creative.*

the media that carried it. That confounds the two and can lead to incorrect insights and investments. But as early as 2017, there was recognition that creative often accounts for 50% or more of advertising impact (which may be low, depending on the category).



In 2018 and 2019, brands were talking about the barriers of measuring creative with attribution and the lack of granularity to get to specific messages. Then in 2020, neural networks were discussed as a mechanism for assessing creative at scale. The use of AI and computer vision to isolate and identify the impact of creative assets at scale has clearly grown over time. AI allows for more granular understanding of which creative elements (e.g. messaging, visuals, music) drive impact across different audiences and contexts.

Some key developments in creative measurement include:

- Isolating creative impact within attribution and mix models
- Quantifying creative wear-out and optimal rotation strategies
- Using machine learning to decode creative elements that drive performance
- Connecting creative characteristics to both short-term response and long-term brand building

These innovations continue to develop. Most recently, we have seen several case studies showing the payoff in significant performance improvements through creative optimization. For instance, one brand reported a 14% lift in campaign impact purely through better creative rotation, with no additional media spend.

*Early attribution and mix modeling approaches typically didn't isolate the impact of creative from the media that carried it. That confounds the two and can lead to incorrect insights and investments.*

Looking ahead, there is significant interest in how generative AI may impact both creative development and measurement. This could potentially allow for even more rapid testing and optimization of ad creative. The enhanced focus on creative measurement is pushing marketing analytics beyond just media mix optimization to more holistic campaign optimization. Leading companies are using these insights to better align creative development, media planning and performance measurement.

## TREND 9: FOCUS ON ORGANIZATIONAL ADOPTION

While much of the focus in marketing analytics has been on technical capabilities, there has been growing recognition of the importance of organizational factors in driving impact. This includes topics like breaking down silos, driving cross-functional collaboration, and building analytical literacy across marketing teams.

Early presentations highlighted structural challenges in applying advanced analytics within traditional marketing organizations. Attribution insights often conflicted with existing channel-specific KPIs and budget ownership.

Since analytics were historically housed in separate siloes, the drive for more integrated evaluation, optimization and activation posed considerable challenges. How to “get everyone on the same page,” or “create a single source of truth” is easier said than done – and continues to be an enormous challenge today. Clearly success depends on organizational readiness and management’s ability and willingness to take control of very diverse areas, like far-reaching retail media or salesforce performance that are now represented in a single, comprehensive model.

Recently, we saw a case study in which a major global firm was able to evaluate and optimize marketing spending across products and countries. Imagine the courage that required! These challenges are often outside of the comfort zone of rationally oriented analysts, but they are the essence of good management.

Over time, there has been an increasing focus on change management and analytical transformation. This includes efforts around developing common analytic languages and frameworks across teams, education and evangelizing that will help the human side of this modeling transition.

Looking ahead, the rapid advance of AI capabilities is creating new organizational challenges. Companies are grappling with how to integrate AI-driven insights and recommendations into existing workflows and decision processes.

This will be an ongoing issue for the analytics industry for years to come.



# CONCLUSION

The past eight years of the Attribution Accelerator have seen significant advancement in marketing analytics capabilities and applications. Measurement approaches have grown more complex and integrated, leveraging a wider array of data sources and advanced modeling techniques. There has been a clear shift toward more holistic, action-oriented analytics that connect short-term performance to long-term value creation. However, challenges remain, particularly around data management, cross-channel measurement and organizational adoption. The rapidly evolving privacy landscape continues to create hurdles for marketers and analysts alike.

Artificial intelligence and machine learning have emerged as powerful tools to address many of these challenges, enabling more sophisticated modeling, faster insights, and enhanced optimization capabilities. However, the effective application of AI requires careful consideration of interpretability, bias and integration with existing processes.

While much of the focus has been on technological advancements, the importance of human expertise and organizational factors has become increasingly clear. Successful implementation of advanced analytics requires not just sophisticated tools, but also analytical literacy across the organization, cross-functional collaboration and leadership support.

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Looking ahead, analytics is likely to continue its rapid evolution. As the complexity of the marketing ecosystem continues to grow, the role of analytics in driving effective decision-making will only become more critical. The journey of marketing analytics over the past eight years reflects the broader digital transformation of business. As we look to the future, it's clear that the field will continue to play a pivotal role in shaping how companies understand and engage with their customers in an increasingly data-driven world.

