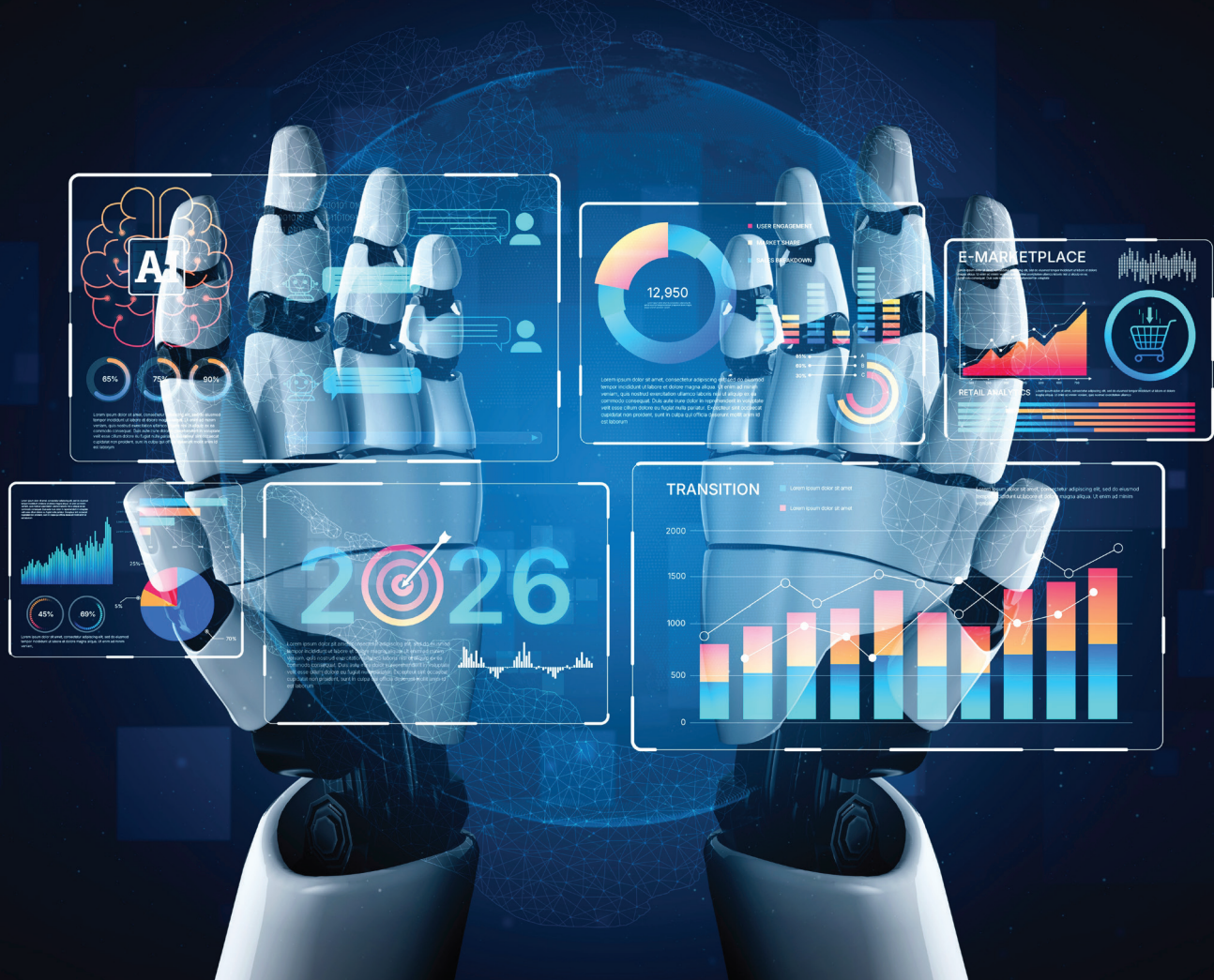


ACCELERATING MARKETING EFFECTIVENESS ANALYTICS IN THE AGE OF AI

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EXECUTIVE SUMMARY

Over the past decade, marketing effectiveness analytics has undergone significant transformation. Traditional marketing mix modeling and attribution approaches have evolved in response to increasing data complexity, fragmentation of media channels, and growing demands for faster, more actionable insights.

Several key shifts are emerging:

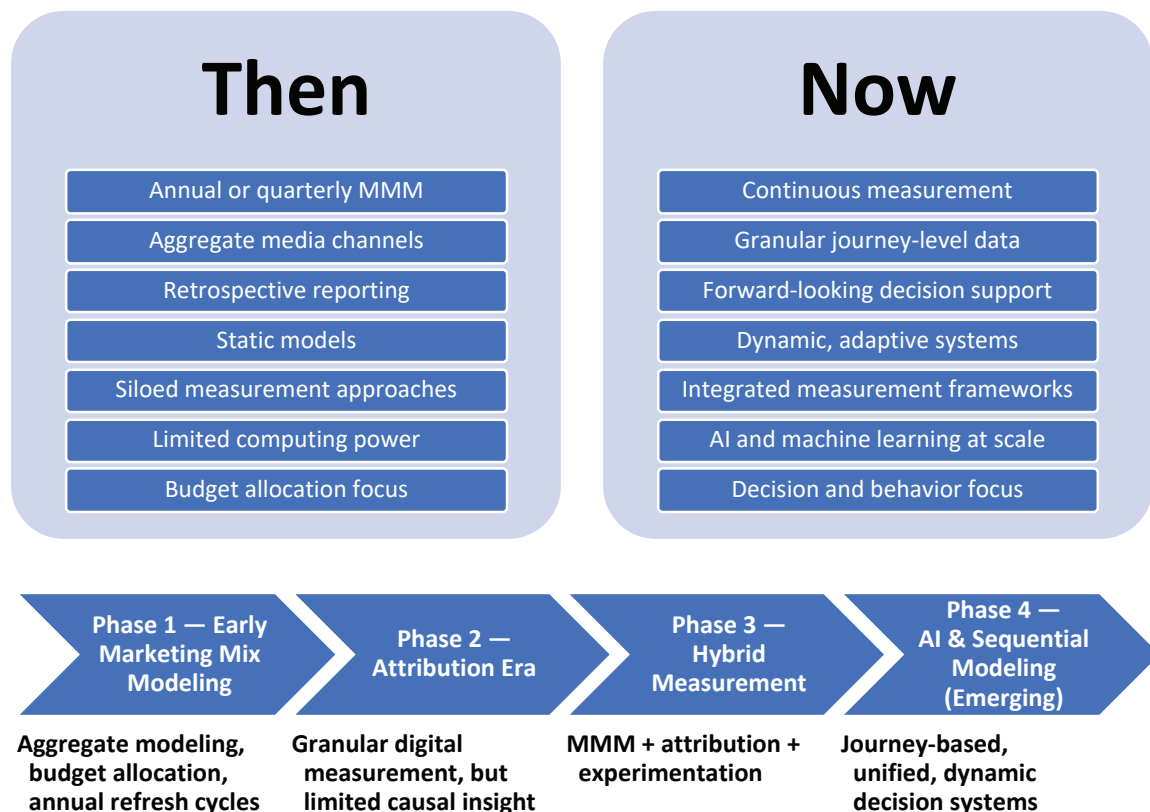
- Marketing analytics is moving from siloed measurement toward integrated, enterprise-wide systems
- AI and machine learning are enabling more complex modeling and faster insights
- Sequential and transformer-based models are furthering our ability to represent marketing as a dynamic

process at the consumer behavior level

- Experimentation and causal measurement are becoming embedded in ongoing analytics workflows
- Analytics is evolving from retrospective reporting toward continuous decision support

These developments suggest a broader structural shift in marketing effectiveness analytics — from measuring past performance to informing future decisions in a more integrated and dynamic way.

This paper reviews the historical evolution of marketing effectiveness analytics, highlights key trends observed over the past decade, and explores how artificial intelligence may accelerate the next phase of development.



REMEMBERING STEVE COHEN

This paper has been sponsored by Mark Garratt of In4mation Insights, in respectful memory of his late business partner Steve Cohen. Steve Cohen was a seminal force in advanced research techniques right up to his passing. Starting in the 1980s, he was very active in the research communities that formed around the Sawtooth Software Conference, the AMA's Advanced Research Techniques Forum (A/R/T) and ESOMAR.

Steve founded Stratford Associates in the 1990's specializing in advanced conjoint/

choice and segmentation methods. In 2006, he co-founded in4mation insights with Mark Garratt. Mark and Steve were original pioneers of hierarchical Bayesian modeling, extending that from conjoint to marketing mix. His last passion was for AI transformer models which in4mation insights is rapidly advancing.

During his lifetime, he was the recipient of many of the marketing industry's most prestigious awards including the AMA Parlin Award, the Buck Weaver Award from MIT and the Ginny Valentine Badge of Courage.

PART ONE: HISTORICAL FOUNDATIONS

PROLOGUE

This paper will review the past 10 years of enormous progress in marketing effectiveness analytics and then consider artificial intelligence and its potential to accelerate progress even further. Before we do that, let's take a moment to understand how we got here. We're fortunate to have the perspective from one of the industry's pioneers and true believers, Jim Spaeth.

Jim was there at the absolute beginning and witnessed models improving media efficiency and becoming indispensable to corporate America. From the get-go, he knew all the players and the promises, the math and formulas, the code and programs, and the advancements and breakthroughs. Having watched the analytics industry grow from the inside, he cuts through the hype to show us why the industry looks like it does, why some things aren't as new as we think they are, and where genuine disruption is likely to come from.

Here's a fascinating first-person account of the marketing analytics industry's origin story that starts, improbably, in the 1600s.

Alice K. Sylvester

April 2026

THE MARKETING EFFECTIVENESS ANALYTICS ORIGIN STORY

by Jim Spaeth

The use of mathematics to formalize decision-making has a long history. Some would say it goes back to Blaise Pascal, the inventor of probability theory, in the 17th century. The mathematics that became known as operations research progressed over the years and development

accelerating during the Second World War. But progress lagged because manual computation methods were cumbersome, slow and, in many cases, just impractical. The development of computers changed all of that. By the 1960s operations research had moved beyond academia and the military into the world of business.

I had summer jobs at Young and Rubicam in the late 1960s. Y&R had an innovative time-sharing computer and a very large research department headed by the legendary thought leader Bill Moran. This department had an entire unit devoted to decision systems – optimization, analytics, forecasting, all model-driven, and made practical by their computer.

I went back to Y&R for a full-time job in 1970, in the research department. Shortly after that, Y&R brought George Williams, a brilliant statistician, from their London office to their New York office and I was fortunate enough to become his assistant. George designed and I implemented many advanced media models, but the crowning creation was a simulation model (in today's language, synthetic data) of the impact of advertising and other marketing variables on sales. It was a beast and took forever to run. You may wonder why an advertising agency would invest so much on this ambitious undertaking. It's very simple. They needed to prove that advertising worked. We used this model to make spending budget, allocation, and scheduling decisions. The model worked well, but it was still a beast.

We referred to this model as an advertising response model, because of its primary focus on advertising. Today, with modeling's scope widened to encompass all of marketing, we prefer, marketing effectiveness analytics.

Later at Y&R we were joined by Ed Dittus. Ed and I continued the practice at Y&R after George went on to General Foods. At GF, George built a successful internal consulting practice, but he needed his own minicomputer because the model was still a beast. A few years later I also joined GF, in my own role in marketing research, and began to use regression modeling instead of simulation. Ed had made the same change at Y&R and, at some point, George changed techniques as well. Regression had long been used by economists for macro-economic analysis and forecasting, but not much for micro-economic applications like modeling consumer purchase behavior. This technique lost some of the insights provided by simulation, but it was much more practical – not a beast! I think this may have been the birth of marketing mix modeling.

the days of just three networks and seven “ladies’ magazines” that comprised most CPG media plans. We had a pretty complete representation of the marketing mix, for a simpler world than today’s.

The use of Marketing Mix Models (MMMs) spread slowly in the CPG arena. Many marketing and media executives were resistant to having their judgement second guessed by a “computer.” But enough were open that the modeling practice was able to prove itself. In 1989 Ed Dittus, along with Jim Friedman and Jan Fish Brown founded MMA (Media Marketing Analytics), to commercialize MMMs. The same year Hudson River Group was founded by Sean Rice for the same purpose. Both firms met with success and others followed. In fact, years later George Williams built a

“In those days a model might include a dozen independent variables (causal factors) – a fraction of what we find in today’s models”

The other critical factor was new, more granular and timely, data. In 1980, Nielsen launched ScanTrack – weekly, highly granular supermarket sales data based on UPC scanner data. The same year, IRI, now Circana, launched BehaviorScan, using UPC data for test marketing. They followed with a national UPC-based sales tracking service, InfoScan in 1986. The sales data was packaged with retail promotion data. When combined with the manufacturer’s own marketing data and advertising delivery data, a fairly complete data set for model building was readily available. In those days a model might include a dozen independent variables (causal factors) – a fraction of what we find in today’s models. Of course, those were

modeling practice at ASI (pre-Ipsos) under the leadership of Bill Moulton. George trained two very bright analysts, Nancy Smith and Sharon Ameri who later went on to found Analytic Partners and The Modeling Group, respectively. TMG was later acquired by Nielsen as the foundation of their MMM practice. Analytic Partners went on to become the largest independent modeling firm in the world.

There were other practitioners, especially in the academic world. Len Lodish and John Little did important pioneering work and took their expertise commercial with Management Decision Systems, later sold to IRI as the basis for their data management

and analytics practice. Dominique Hanssens was also doing pioneering work in the 1980's. In fact, we can look all the way back to Koyck, a Dutch economist who, in the 1950's, developed the distributed lag model, central to marketing mix modeling. And there were others, but this paper is not intended to be a comprehensive history of MMM.

The center of the practice moved from agencies trying to prove advertising worked to CPG firms trying to optimize their marketing investments. Over time it moved to other verticals and on to firms that sell directly to consumers. MMM use was tied to budget cycles to support budget setting and allocation decisions. These cycles tended to be annual, sometimes with a mid-year "replan." More granular data were available, but not needed for setting, or allocating budgets into strategic categories. The annual, or semi-annual analysis cycles were sufficient, although there was no real reason why the models could not be rerun more often. Management focus was often fixed on decisions with quick response from the marketplace – distribution, pricing and promotion, in addition to media budgets and allocations. Ironically a technique born at an advertising agency didn't consider media tactics, scheduling, or creative efficacy. Of course, there were exceptions.

The practice of marketing mix modeling grew to be fairly ubiquitous. In the 1990s The ARF conducted two best practices benchmarking studies that helped spread the adoption of this technology. Consulting companies like Forrester and Gartner and, later, Sequent Partners, also helped marketers make the best use of modeling. But for no technical reason, marketing mix remained a backward-looking, high-level budget and strategy report card. Tactical optimization was not even considered. Although these models had baselines, they were not considered a reflection of the

brand's contribution, we just thought of them as "momentum." It took Carl Mela's pioneering work for us to see that there was important information and opportunity in the baseline. There was also Millward-Brown and their continuous brand tracking studies that provided an opportunity to analyze marketing's contribution to brand value. Or, in the case of excessive price-promotion, the denigration of brand value.

As we entered the digital era, of so called "real time" automated decision-making, MMMs were just not good enough. They were:

- Updated on an annual or semi-annual cycle
- Fitted to three years of data, making them "backward-looking"
- Used for budget allocation, not granular enough to optimize tactics
- Did not consider changes in advertising effectiveness, as campaigns changed over time
- National, using local data for degrees of freedom, not insights
- Focused primarily on sales outcomes, despite advertising's principal goal of building brand equity

In retrospect, none of these were technical limitations. This was not a failure of the technology. It was a failure of imagination. Market mix modeling was assigned a role and it, very complacently, stayed in its allotted lane.

Data scientists in the digital sphere developed attribution modeling. It was highly granular, fully automated, and almost instantaneous. It filled the void left by the practice of MMM. Unfortunately, attribution models, in those early days, suffered from missing variable bias because they often looked at one variable at a time and never

“But for no technical reason, marketing mix remained a backward-looking, high-level budget and strategy report card (...) This was not a failure of the technology. It was a failure of imagination.”

looked at causal factors outside of the digital world. The basic technique, last click attribution, did not accurately identify causal relations between tactics and outcomes, it just pointed to the website visited prior to landing on the page designated as the campaign’s goal. Sequent Partners was consulting in this arena and wanted to shine a light on this promising, but flawed, technique. We wanted to help the industry fix it; to accelerate development and technical improvement. That was the birth of the Attribution Accelerator.

Over the past 10 years, the Accelerator has showcased some of the best work in the marketing analytics field. It has been very gratifying to see the improvements, to some degree fostered by the Accelerator. We watched the decline of digital data, due to privacy policies and regulations, and its negative impact on attribution modeling. We saw marketing mix modeling rising from its “failure of imagination” to fill the void left by attribution, to a fair degree. In fact, we would say that marketing mix modeling has been increasingly fulfilling its promise to be accurate, reliable, comprehensive, granular, strategic and tactical, fast and efficient. No, not real time, or quite as granular as attribution, but far from the rearview mirror, report card, of the early days.

The next several pages will outline the trends that we have seen over the past 10 years and how they have transformed the practice of marketing mix modeling and its growth into one of the cornerstones of marketing

effectiveness analytics. In the past two years, we have seen meaningful applications of AI. Earlier ancillary AI applications in data preparation, model queries and process automation (machine learning) have been valuable. But in the past two years, we have seen AI improve the model architecture itself. The Accelerator has granted us a privileged position from which to view these developments and assess their impact on marketing for the next few years.

Read on!

PART TWO: A DECADE OF MARKETING ANALYTICS PROGRESS

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

The past decade has witnessed the head-spinning evolution of marketing analytics. Techniques, data and applications in use today were, at best, just visions ten 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 its 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. What have we learned? Let's dive in!

By analyzing case studies from marketers and their research partners, we identified

nine key trends that have shaped the field of marketing analytics:

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.

Over the years, the Accelerator hasn't just tracked technical innovation, it has surfaced pressure points in marketing effectiveness measurement. For instance, as of 2025, the accuracy of incrementality estimates

1. Increased complexity of modeling methods

Movement from simple regression models toward more advanced, multi-layered analytical approaches

2. Drive for integrated 360-degree, enterprise-wide models

Shift from siloed measurement toward unified, cross-channel enterprise measurement systems

3. Explosion of data and associated challenges

Growth in data volume, granularity, and the need for new methods to manage signal vs. noise

4. Rise of randomized controlled tests

Increased reliance on experimentation to establish causal relationships

5. Growth of machine learning, AI and synthetic reconstruction of signals

Use of AI to fill data gaps, model complex interactions, and reconstruct missing signals

6. Improved measurement of long-term and brand effects

Greater emphasis on understanding sustained brand and equity impacts

7. Push for greater actionability and faster insights

Shift from retrospective reporting toward decision-oriented analytics

8. Enhanced measurement of creative impact

Increased ability to measure and optimize creative effectiveness

9. Focus on organizational adoption, governance and trust

Recognition that adoption, transparency, and governance are critical to success

remains unresolved, especially in retail media and platform reporting. The reliability of behavioral signals is being highly scrutinized. Components of identity matching, stability of IP addresses, timing of campaign exposures are not assumed to be accurate anymore - they're being questioned. Tension also persists between brand effects and sales performance - short term ROAS continues to disproportionately impact budget allocation. And finally, organizational trust lags behind technical ability. C-suite skepticism, conflicting viewpoints on methods, misinterpretation and misinformation all continue to plague marketing analytics in 2025.

TREND 1: INCREASED COMPLEXITY OF MODELING METHODS

Over the past 10 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 incorporate more advanced techniques like Logit models, Bayesian methods (including empirical Bayes, Hierarchical Bayes and Pooled Hierarchical Bayes) and, most recently, complex deep learning AI-based methods. We've seen the practice move from basically a digital attribution product in a digital silo to something more integrated across the entire enterprise to a far broader range of media, marketing and marketplace drivers.

In the early years (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 two-thirds 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. But the promise of individual level analytics was exciting, and the industry had to solve it.

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 resulting 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 the 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 in 2019, mix modeling evolved to fill some of the gaps by becoming more frequent and more granular.

estimating incrementality, tests measuring MMM accuracy decays over time and enterprise-scale unified systems integrating media, trade, pricing, and distribution and more, even when those drivers have different resolution both geographically and temporarily. What began in 2016 as a debate over last-click attribution has evolved into a more rigorous, experiment-informed models that account for uncertainty and multiple drivers of performance. The methodological

“What began in 2016 as a debate over last-click attribution has evolved into a more rigorous, experiment-informed models that account for uncertainty and multiple drivers of performance.”

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

The progression toward modeling sophistication continued in 2024 and 2025. In 2024, we saw greater use of synthetic controls and bias-correction matching, integration of creative performance into marketing mix models, near real-time attribution pipelines and hybrid MMM, MTA and incrementality triangulation.

2025 presentations at the Accelerator featured Hierarchical Bayesian marketing mix models calibrated with experimental data, AI-powered journey models that capture complex cross-channel behavior and estimate outcomes with explicit confidence ranges, methods that account for non-random media exposure when

arc clearly bends toward rigor, dimensional breadth, and structural complexity.

Without overclaiming much, there is case study evidence that today’s models can unify systems, get closer to explicitly identifying causal effects, quantifying uncertainty, integrating experiments, managing lifecycle decay and defending against bias. We expect sophistication to continue to grow with the rise of techniques leveraging machine learning and AI. Clearly, this trajectory is a long way from where we started with simplistic digital attribution models.

TREND 2: DRIVE FOR INTEGRATED 360-DEGREE MODELS

As the marketing landscape has grown 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. It makes sense. Digital media promised full trackability at the time, replete

with real-time reporting, and marketers were searching for those capabilities outside of the digital realm in order 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 on 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 myriad external factors that impact response. For example, “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 of the marketing factors at their disposal and get the greatest payback from their marketing investments. While many important marketplace factors (season, weather, economy, etc.) 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.

Throughout the past decade, we have seen a lessening of separate models for attribution, next-touch prediction, lifetime value, and macro-level ROI, and an increase in single underlying models capable of producing multiple business outputs simultaneously.

This shift is not merely about computational power. It reflects a deeper structural change: marketing measurement is on its way to becoming architecturally unified.

Traditional modeling approaches segmented the stack – for instance, multi-touch attribution at the user level, MMM at the aggregate level, CRM and forecasting were modeled separately. Each of these operated within its own assumptions, priors and data constraints. In 2025, a new generation of AI-based transformer-based systems collapsed those boundaries. Case studies demonstrated how a single model learns behavioral patterns across journeys, channels, content, with data denominated in various units of time and geography, and then generates multiple outputs – attribution, propensity, lifetime value, and increasingly, macro-level planning inputs – from that shared representation. The implications are significant: integrating micro-level behavioral structures into macro-level modeling represents a potential correction to the long-standing disconnects in marketing measurement.

It’s becoming possible to see a future where revenue drivers across an organization are modeled in one connected system.

“This shift is not merely about computational power. It reflects a deeper structural change: marketing measurement is on its way to becoming architecturally unified.”

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 10 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, that threat engendered a number of 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 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! But 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.

This conversation continued in 2024. Signal loss, fragmentation, increased volume of exposure data, continued to dominate measurement concerns. In addition, at this time, attention took hold as a new class of signal – and brought with it familiar challenges. Issues of definitional inconsistency, validation and integration brought age-old questions to entirely new datasets.

By 2025, the conversation moved beyond concerns about data volume toward more fundamental questions of data reliability. Several presenters highlighted formal audits of IP-based identity systems that revealed unexpectedly low household-level precision, raising concerns about compounded error across identity resolution and attribution layers. There was explicit discussion of synthetic reconstruction methods used to address exposure gaps in privacy-constrained environments, as well as operational challenges such as inconsistent

metric definitions across platforms and limited transparency around event-level timestamps. These issues position data quality — not just model sophistication — as a first-order measurement challenge.

While AI and machine learning were cited as tools to assist with cleaning, integration, and anomaly detection, brands emphasized that sustained human oversight remains essential to ensure usability and trust.

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.

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

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.

But in 2024, controlled testing was no longer a side tactic. It had become embedded across formats, channels and modeling systems. Several presentations explicitly anchored their results in experiments and showed quasi-experimental design at scale. In one presentation, we saw the shift to counterfactuals from correlations as controlled testing principles were being operationalized inside always-on attribution

“But in 2024, controlled testing was no longer a side tactic. It had become embedded across formats, channels and modeling systems.”

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

systems. Creative testing with structured experiments across pre-tests, in-market tests and post-campaign lift validations showed how testing is also migrating into creative development and evaluation.

In 2025, we saw the continuation of experimentation. There was a presentation on Bayesian calibration of MMM outputs with experimental data, one on holdout validation frameworks embedded in modeling pipelines, and another on instrumental variable approaches to approximate quasi-random ad exposures. To be sure, very little of this is about pure randomized control tests. Instead, we see testing principles at work – synthetic controls, matching algorithms, quasi experimental design and triangulation. Going forward, the presentations from 2025 suggest the rise of controlled testing is not about occasional randomized control tests but embedding a complete program of experimental logic into everyday measurement. That's a big shift and it's not clear if how broadly this best-practice has been adopted.

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 machine learning 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. Advertisers at the Accelerator have stated that they just want to know whether a solution is faster, cheaper, or provides insights they could not have obtained otherwise. The technical details of how AI works are secondary. One marketer said that AI itself is not inherently compelling—what matters is the business outcome it delivers. 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.

AI was in full force at the 2024 and 2025 Analytics Accelerators. In 2024, one of the speakers explained that data quality and AI were their main priority. By limiting AI use cases to clean, trusted datasets (mostly first-party and internally developed data), their outputs are based on validated information. They consider this the safest path since they work with stakeholders who tend to be skeptical about generative AI applications.

Another panelist discussed AI's role in filling gaps in missing touchpoints sequence data. They demonstrated that counterfactual techniques could determine whether

including a particular exposure or behavior improves a model's predictive power.

In addition, we saw other applications such as AI-driven creative pre-testing, attention prediction models, real-time attribution analysis, and automated “parameter tuning,” (e.g., letting the system automatically find the best internal settings for a model instead of relying on manual trial-and-error by analysts.)

2025 was a banner year for AI at the Marketing Effectiveness Accelerator. In fact, the nature of the presentations suggested a dramatic change in the use of AI in modeling. Transformer-based unified causal architectures, audience simulation engines for scenario testing, neuro-AI models predicting brain-region responses at scale and risk-adjusted optimization via variance estimation all signal a shift in the perception of AI. Originally, benefits were about speed and efficiency. But now, AI appears to be reshaping how models are built, validated, and deployed. It's a cautious, careful evolution. But it's starting.

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

A key theme over the past 10 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. “Stuck at the bottom of the funnel.” But 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 1% 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 /30% brand building media to optimize both immediate sales and long-term growth.

In 2024 and 2025 the conversation continued. We saw evidence of brand messaging outperforming performance messaging for SharkNinja. Circana quantified the long-term impact of brand equity with nested models connecting brand equity metrics to long-term sales contributions. In their case study, they reported that brand equity alone contributed 8-14% to long term sales performance. Molson Coors, Circana and Google shared an approach to reach/frequency modeling that clarifies upper-funnel ROI modeling.

At this juncture, long-term brand effects are being quantified with a number of different approaches. The 2024-25 programs reflected

more structural integration of brand equity into commercial modeling systems. Rather than treating brand lift as a standalone survey outcome, several case studies place brand variables directly within marketing mix models, demonstrated how brand effects moderate sales performance and modeled halo effects across portfolios. It looks like brand building is becoming a quantifiable driver rather than a “soft” complement to performance media.

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. But there is clear tension - the need to balance speed with accuracy and sound strategic thinking. The role of humans in the process, 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 of the same company actively competed with each other in the programmatic bid process due to an uncoordinated organizational structure.

The trend is evolving from “get results faster” to “embed analytics into continuous decision loops.” We’re seeing a system-level shift, way beyond reduced reporting lag. Presentations from 2024-2025 demonstrate analytics systems increasingly woven into media planning, budget allocation, and creative optimization workflows. Faster MMM refreshes, automated parameter exploration, and scenario-based allocation modeling highlight the move toward continuous decision loops.

These benefits must be considered within an important technical limitation. When degrees of freedom are sliced more thinly into finer geographic, temporal and tactical dimensions, statistical confidence is diminished.

At the same time, marketers acknowledged that accelerating the timing of insights introduces organizational volatility and friction. And suddenly people are talking about the need to balance speed with credibility and trust. The conversation isn’t only about faster insights, it’s about decision-speed, planning integration and embedding insights into standard operations.

We suspect in coming years speed will become reframed as a governance issue – faster models require automation, organizational maturity and a tolerance for shifting answers. We will see how this arena evolves.

TREND 8: ENHANCED MEASUREMENT OF CREATIVE IMPACT

Improving the measurement and optimization of creative has been a key theme in the Attribution Accelerator. 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 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 19, brands were talking about the barriers of measuring creative with attribution and the lack of granularity to get to specific messages. But 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.

By 2024, the industry entered the “creative quality assessment industrialization era.” Automation and scaling of creative pretesting through AI has left the bleeding edge and become adopted as part of the creative workflow. Now, measurement of creative components like text, images and video can be extracted via AI-created structured data for modeling. AI industrialization will allow a much greater volume of content to be tested (one estimate is that multinational companies test less than 2% of their assets given time and budgetary constraints.) Training AI creative datasets on an enormous number of human sessions could potentially allow for even more rapid testing and optimization of ad creative, allowing brands to learn faster and iterate more effectively. Google demonstrated that although creative attributes cluster around broad themes, specific attributes will vary over time, audience and context. They cautioned that brands will not find a universal formula or fixed checklist to follow.

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. The automation and scaling of creative pre-testing will only be possible through

AI. But interestingly, the breakthrough in industrializing pretesting is embedding performance signals directly into creative workflows and enabling rapid iteration across thousands of assets before launch.

Everything we've seen in creative measurement was not AI driven. In 2025, a case study from KitchenAid illustrates that creative optimization breakthroughs do not always stem from AI or modeling innovation. They can come through disciplined integration of creative diagnostics, exposure data, and audience strategy — and the organizational alignment to act on it mid-flight. Interestingly, KitchenAid grouped assets into thematic buckets to isolate which creative elements were wearing out rather than testing individual executions in isolation. It goes beyond testing execution “A” or “B” to determining whether the emotional territory, product framing, tone or audience strategy is still working.

Another look at creative effectiveness highlighted the influence of the environment on performance. Pinterest and Magna presented research suggesting that ads inherit part of the emotional tone of the environment in which they appear. As we've known for a long time, media context can amplify or dampen creative effectiveness. This underscored that media isn't only about delivery, it's mood-setting. Creative effectiveness is conditional. Context should be part of optimization models and siloed measurement misses a good part of the story.

And finally, getting us ready for the day when AI creates the ads itself, a framework for evaluating images was presented by Professor Overgoor of Cox School of Business, Southern Methodist University. Overgoor described a process built around “neuro-vision transformer architecture.” This involves AI that models how humans

visually attend to and cognitively process images using transformer architectures to approximate that process at scale. It was trained on 73,000 fMRI-labeled images, and using a neural network backbone trained on billions of natural images, which predicts the brain's region-level responses directly from any image at scale. The goal is to avoid the black-box opacity of machine learning, or scale issues from neuroscience. Evaluation of creative elements via some sort of AI will undoubtedly continue in the coming years. Expect it to be a big ongoing topic.

TREND 9: ORGANIZATIONAL ADOPTION BECOMES THE DECISIVE FACTOR

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.

strategic planning functions. One of the panel discussions in 2025 suggested that organizational adoption is a structural re-design issue, a budgeting authority issue, a change management issue, a governance issue and a trust issue. It's not only an educational issue. AI is simultaneously democratizing access to analytical outputs, while raising new questions about governance, training, and human oversight. In this environment, organizational adoption becomes less about technical literacy and more about designing workflows that can responsibly integrate AI-driven recommendations.

“The industry’s primary constraint is no longer modeling sophistication, but organizational alignment.”

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.

At recent Marketing Effectiveness Accelerators, industry leaders reinforced the notion that the industry’s primary constraint is no longer modeling sophistication, but organizational alignment. They spoke of mistrust and confusion in measurement and C-suite skepticism. They believe standardized, harmonized methods can break the bottleneck around AI deployment and speed adoption.

As media mix and causal AI capabilities mature, authority over research budgets is shifting from traditional insights teams toward growth offices, finance, and

The first eight years of the Accelerator were clearly about the industry building capability — better models, more data, faster insights, stronger creative measurement. The last two years, especially 2025, begin to show people asking a different question. They’re no longer asking, “can we do this?” they’re asking, “can we trust this, standardize it, and run the enterprise on it?” The analytics industry is maturing and possibly entering a new phase.

SUMMARY OF TRENDS

The past 10 years of the Marketing Effectiveness 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.

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 10 years reflects the broader digital transformation of business. More of a *sense and response* model of marketing, which we used to call direct marketing and now dub performance marketing, versus the theory of a process over time leading to both incremental sales and long-term brand building. An important foundation of the pre-digital world view was microeconomic consumer behavior theory. Considerations such as effective ad exposure frequency,

advertising decay, brand preference impacting price elasticity, etc. Building models with these kinds of theoretical constraints provides confidence that the models reflect the world as we believe it to be. AI based models are atheoretic, abandoning the confidence offered by those theories. 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. But we must proceed with our eyes open.

The conversation at the 2025 Marketing Analytics Accelerator reflects a new focus on consolidation and governance — as well as greater scrutiny of data integrity, formalized causality, enterprise-scale integration, and organizational adoption challenges. The industry appears to be transitioning from a period of rapid technical innovation to one of structural maturation, where transparency, validation, and credibility are as central as methodological sophistication.

PART THREE: THE EVOLUTION OF AI IN MARKETING EFFECTIVENESS ANALYTICS

Artificial intelligence is already reshaping marketing effectiveness analytics. So far, its most visible impact has been on how analytics work gets done rather than on the fundamental modeling approaches used to measure marketing impact. Core methods—marketing mix modeling, attribution, and incrementality testing—remain central.

However, meaningful changes are emerging. Some are already influencing advanced practice while pointing toward a future in which analytics becomes even faster, more integrated into decision-making and more closely aligned with real consumer behavior.

AI IN ANALYTICS TODAY

Automation of Analytical Workflows

The most immediate contribution of AI has been operational. Tasks that once consumed large amounts of analyst time are increasingly automated. These include data cleaning and reconciliation, anomaly detection in data pipelines, variable transformation selection, model validation, and results reporting.

AI-assisted coding tools are also accelerating model development, enabling analysts to produce production-ready scripts more quickly.

An important result is shorter analysis cycles, more frequent model updates, and faster feedback on campaign performance. Automation can also improve data consistency and model validity while reducing manpower costs.

These gains come with important caveats. AI systems still make errors and require human

supervision. In addition, organizations must ensure appropriate governance, since data processed through AI tools may be retained or reused unless confidentiality controls are in place.

Reconstruction of Missing Signals and Synthetic Data

Growing privacy restrictions and platform fragmentation have created gaps in exposure and conversion data. In response, organizations are increasingly using AI to approximate missing signals—such as reconstructed impression sequences or probabilistic identity linkages.

Some are also generating synthetic datasets that remain calibrated to real-world data through continuous updating processes sometimes described as “digital twins.”

These approaches are controversial but increasingly practical. When data are incomplete, they can stabilize models and restore visibility into consumer journeys. This makes it possible to reconnect tactical optimization insights with broader market-level perspectives, enhancing both the quality and clarity of marketing decisions. This leads to a true understanding of the impact of marketing persuasion on consumer purchase and consumption behavior.

However, synthetic approaches depend heavily on the quality and representativeness of the underlying training data. Regulatory constraints limit the availability of data for certain populations, potentially introducing bias. AI may be able to solve this, but only if there is enough representative data remaining.

Natural Language Interfaces

AI is also lowering barriers to analytics access. Instead of navigating dashboards or writing queries, decision-makers can ask natural-language questions such as, “What drove last quarter’s sales decline?”

Systems can respond by querying data, running analyses, and generating explanations. This “democratization” of analytics has the potential to increase marketers’ engagement with analysis outputs and bring insights closer to marketing decisions. Putting analysis insights directly in marketing decision makers’ hands, 24/7, promises to be a transformative force.

As with all AI-generated outputs, responses require verification. These systems are powerful accelerators—not substitutes for judgment.

Analysis of Creative and Content

When considering advertising, traditional marketing effectiveness models have focused primarily on media delivery variables. AI now enables large-scale analysis of creative content itself. Models can incorporate features such as visual complexity, emotional tone, spokesperson presence, brand cues, contextual placement and even specific audio-visual content elements.

This expands the analytical lens from media exposure to persuasion mechanisms. AI also supports more systematic creative optimization, including the development of personalized ad variants for different audience segments.

The potential upside is substantial. More noticeable, memorable and persuasive advertising can be created, further enhanced by personalization for specific target groups. Real-time identification of creative wear-out can prevent wasted spend and improve campaign effectiveness.

In summary, AI’s current contribution is mostly operational: accelerating data preparation, improving scalability, enabling continuous monitoring, and broadening access to insights. These operational changes are already making marketing analytics more useful in day-to-day decision-making. However, AI’s ability to create advertising is the big exception – we have yet to see, but fully expect, immense operational disruption associated with fully automated strategy and creative development streams.

WHAT’S HAPPENING AT THE LEADING EDGE OF MARKETING EFFECTIVENESS ANALYTICS?

While most organizations are still focused on operational gains, a smaller group of academic researchers at institutions like the Robert H. Smith School of Business and The Wharton School and modeling firms such as DataPOEM and in4mation insights are exploring how more structural AI techniques—particularly sequential models and transformer architectures—can better represent the timing and interaction of marketing exposures across customer journeys and decision processes. The promise of these efforts is to expand the analytical toolkit, emphasizing automation, richer data integration, and models capable of handling the growing complexity of modern media environments. These systems finally represent marketing as a dynamic process of consumer behavior unfolding over time.

Sequential and Transformer-Based Marketing Models

Traditional marketing mix models analyze aggregated time periods in which multiple activities are assumed to occur simultaneously. Sequential models instead treat marketing as a series of ordered exposures and responses.

This shift allows analysts to study patterns such as exposure order, spacing between touchpoints, interaction effects, and memory decay. Rather than estimating static channel contributions, models can evaluate how combinations and sequences of exposures influence outcomes.

Transformer architectures—widely known for their role in large language models—are particularly suited to this task. They can analyze entire exposure sequences simultaneously and dynamically assess which prior events are most relevant for predicting future behavior. Transformers can leverage thousands of features in very high-dimensional sequence/journey data, including non-linear effects, complex interactions and long-term dependencies, and can estimate multiple outcomes all in a unified model with explicit variance optimization and confidence-interval based optimization. This is a significant structural jump in modeling capabilities.

Hybrid Causal-Sequential Systems

The most promising developments combine sequential, transformer, models with incrementality experimentation and econometric models. These hybrid systems aim to unify prediction and explanation within a single analytical framework.

Embedding experiments at scale and speed helps anchor AI-driven models to current observed lifts rather than historical correlations. Constraining consumer journey outcomes within econometrically identified boundaries keeps them in the real world. This unified approach improves budget allocation credibility, supports more realistic scenario planning, and can increase model stability over time.

In practice, these architectures may reduce the conflict created by separate models for attribution, forecasting, customer value, and optimization. Shared behavioral representations allow multiple decisions to be informed by a consistent analytical foundation.

“The most promising developments combine sequential, transformer, models with incrementality experimentation and econometric models.”

The result is improved predictive accuracy, a richer insight into cross-channel dynamics and a deeper understanding of consumers’ paths to purchase. However, these models remain focused on prediction rather than explanation. Without experimental inputs or causal constraints, they do not automatically establish cause-and-effect relationships. Nor do they provide insights about consumers’ responses to marketing, although more recent work on *explainability* is trying to cure that blind-spot.

IMPLICATIONS FOR KEY MODELING CHALLENGES

Early evidence suggests that sequence-based AI approaches may help address several longstanding issues in marketing analytics:

- **Collinearity:** Transformers’ self-attention mechanisms identify interactions at the event-level, rather than estimating fixed coefficients. AI systems can reduce instability caused by correlated

marketing signals in two ways. First, by separation — weekly data, typical of marketing mix models, makes all events in a given week seem coincident, while event level data separates these events in time and will likely reveal more variability. Second, because the order of events is a key feature of the model, spurious causality is filtered out — only an antecedent can be causal.

- **Granularity and sparsity:** High-dimensional environments can be handled through shared representations that allow rare events to contribute to learning. These models can also drill-down to identify and optimize tactical opportunities beneath the scope of marketing mix models.
- **Speed of learning:** Event-level modeling, supported with experiments, enables faster directional insights, though long-term outcomes such as customer lifetime value, still require extended observation.
- **Integration:** Multiple prediction tasks can be supported by a common behavioral model, improving operational efficiency.
- **Insights:** Diagnostic techniques, such as counterfactual simulation, feature attribution methods, and attention pattern analysis enable interpretation of model-based insights.
- **Over-reliance on Priors:** Bayesian MMMs rely on priors to stabilize estimation in the presence of collinearity and limited variation. But they also introduce judgmental assumptions, which are not required by transformer models.
- **Complexity:** Transformers can reflect the complexity of the marketplace, with numerous interactions, long-term effects, and multiple outcomes.

These benefits come with trade-offs. Transformer models can be complex, computationally expensive, and difficult

to interpret. Extracting actionable insights requires new diagnostic techniques and new ways of thinking.

Probabilistic Decision Systems

The potential offered by transformers to recognize uncertainty, instead of just producing single-point estimates, enables these analytical systems to provide variance measures, confidence intervals, and risk-adjusted optimization recommendations.

Such probabilistic thinking has long been standard in finance. Its adoption in marketing analytics would represent a meaningful change in how analytical outputs are used, enabling marketers to evaluate trade-offs between expected return and decision risk, prioritize experiments where uncertainty is highest, and plan across best- and worst-case scenarios.

Automation of Model Development

Advanced AI systems are also transforming the modeling process itself. Rather than manually specifying lag structures, interaction terms, and functional forms, analysts can train models that search across large design spaces to replicate historical patterns.

This can reduce modeling bias, improve accuracy, and enable continuous model updating to improve marketers' response time to competitive or environmental shifts. At the same time, increased automation reinforces the need for expert oversight to ensure that models remain grounded in business reality. This change of roles will require new ways of working with models; new training and skills.

LOOKING AHEAD

Developments on the leading edge are promising and exciting, but they are at a very early stage and will require a good deal

of development, distribution and adoption. There will be surprises along the way – positive and negative. It will be a number of years before today’s promises are more fully realized.

When we look just beyond that horizon, we can imagine more aggressive developments, but these will require more than modeling technology -- changes in data feeds and system interoperability will require the adaptation of the broader marketing ecosystem. The biggest hurdle of all will be trust -- the willingness of marketing managers to trust analytical insights and predictions.

Real-Time Decision Support

Over time, these developments may support real-time decision environments in which campaign performance is

analytics could connect directly to activation platforms, enabling partially autonomous budget allocation and creative rotation decisions.

Such systems would effectively function as marketing operating platforms—integrating planning, analysis, and execution. Achieving this vision will require substantial advances in data availability, system interoperability, and organizational trust.

We are already seeing early, limited applications of this type, but much work lies ahead to fully realize this opportunity – industry standards, and platform interoperability will be essential, though challenging.

But the potential benefits are enormous – automating, improving and cost-reducing much of marketing execution.

“Such systems would effectively function as marketing operating platforms—integrating planning, analysis, and execution.”

continuously monitored and optimization recommendations are generated dynamically.

With the necessary data feeds, AI systems will be able to: monitor campaign performance in real time, detect performance changes, recommend budget adjustments, suggest creative rotation changes, identify audience expansion opportunities and more. This would fulfill many of the ambitions of the analytics providers and users since the earliest days of the practice.

Continuous, Real-Time, Autonomous Optimization

In more mature implementations, AI-driven

ORGANIZATIONAL IMPLICATIONS

As analytical processes become more automated, the nature of analytics and marketing roles will evolve. Routine modeling and reporting tasks are likely to decline, along with tactical marketing activation tasks, while strategic interpretation and high-level, creative, decision-making become more important.

Analytics organizations may shift from project-based consulting toward continuous data infrastructure and decision support. Agencies and brand teams will also need new skills—particularly the ability to frame effective questions.

This transformation of marketing promises to make marketing far more responsive, effective and efficient. But historically, such changes have never proven easy. New training and new ways of working and even thinking will be required. And the AI-fueled models will have to live up to the promise. Only time will tell.

A FINAL WORD OF CAUTION

Despite rapid progress, several constraints remain.

Causality continues to be the central challenge. Observational data alone cannot fully resolve whether marketing drives behavior or responds to it. Controlled experimentation remains essential.

Human supervision is still required. AI systems can accelerate analysis but cannot yet be trusted to operate independently.

Confidentiality and privacy governance must be carefully managed as data and strategies increasingly flow through automated systems.

Ecosystem readiness—including data access and interoperability standards—will influence the pace of adoption.

Finally, industry disruption is inevitable. New technologies reshape roles, skill requirements, and competitive dynamics. Some organizations will adapt quickly; others will struggle. There will be winners and losers. And surprises.