

marketing measurement
innovation series

module 4
evolution in market mix
modelling



advertising effectiveness council



Yasmin Sanders
SambaTV (chair)



Jem Salcedo
Azerion



Sebastian Diaz,
Bench



Gavin Merwood
Brand Metrics



Stephen Kyefulumya
Carsales



Vanessa Adams
Cint



Andrew Macdonald
Dentsu



Deryck Wills
Digital Remedy



Neil Anderson
Double Verify



Damon McLoughlin
Ebay



Andrew Rudd
Experian



Amir Jangodaz
Google



Denise McCormack
Hatched Media



John Nguyen
IAS



Gagan Batra
Insighen



Andreea Chirila
Kantar



Steve McMahon
Lifesight



Aimy Le
Meta



Ian Garland
Milton Data



Matt Farrugia
Mutinex



Jonathan Fox
Nine Entertainment



Liam Pook
PHD



Dave Goodfellow
Pinterest



John Hawkins
Playground xyz



Rowena Newman
Publicis



Aurelien Thuaud
REA Group



Jonathan Henshaw
Ryvalmedia



Ashley Spinks
SevenWest Media



Rory Dolan
TikTok



Stephen Warren
News Corp



Kirsten Riolo
Nielsen



Mark Griffiths
On Device Research



Belinda Casselden
Totally AwesomeTV



Natalie Stanbury
IAB Australia

this paper is a collaboration of the iab advertising effectiveness council

The IAB Ad Effectiveness Council have collaborated on this whitepaper to help increase understanding across the industry on how to protect the insights that businesses need to grow, along with best practices for assessing the impact of digital advertising into the future.

The IAB Ad Effectiveness Council undertakes various activities to provide guidance to the industry on the best methods to assess the impact of marketing activities along with insight and inspiration to help marketers optimise their digital advertising investment. The Council includes representatives from media owners, data agencies, media agencies, research companies, tech vendors and advertisers.

The contents of this guidance paper are not necessarily reflective of individual company policies, rather it is a collaborative effort of the members of the council to provide greater understanding to the market.

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background

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The greater restrictions and phasing out of device IDs and third-party cookies along with Australia's evolving privacy legislation presents fundamental but positive change for the digital advertising industry. The reduction in media and customer data available is impacting marketing measurement, particularly the reduction in signals that enable cross-site, app and media environment tracking. These changes provide the opportunity to re-think digital marketing and measurement frameworks to support core industry use cases, while balancing consumer privacy.

Across the industry there is evidence that marketers, agencies, media owners and vendors are getting ahead of these changes, learning how to meet consumers' greater expectations for data privacy and, from an advertising effectiveness perspective, adjusting their measurement in response to signal loss. Innovations are occurring across the industry to protect the insights that businesses need to grow, along with best practices for assessing the impact of digital advertising into the future.

The IAB Ad Effectiveness Council's objective with the 'Marketing Measurement Innovation Series' is to highlight that, while measurement is often seen as a challenge, insightful assessment of marketing effectiveness and campaign performance can continue, in a privacy compliant way. The series highlights real case studies and demonstrates practical examples of how the industry is moving marketing measurement beyond the cookie.

Module one of this innovation series, 'Mapping the Future of Marketing Measurement', provides an overview of the proposed reforms to Australian privacy legislation impacting ad effectiveness measurement along with a recap on the technology changes resulting in the degradation of signals required for some ad effectiveness measurement techniques.

The second module, 'First-party Data Unlocking Measurement Capabilities', is focused on how first-party data is unlocking measurement capabilities and includes information on using data collaboration platforms for measurement and guidance for quality data inputs for specific measurement techniques.

And the third module, 'Advances in AI and Machine Learning Powering Marketing Measurement', outlines how these technologies and tools are currently used and how they may evolve into the future to support greater efficiencies and effectiveness of digital advertising along with faster and more granular measurement insights.

In this fourth module of the innovation series, 'Evolution in Market Mix Modelling', we outline what is driving the increased usage of Market Mix Modelling and how the technique is evolving with advances in computing power and machine learning that can provide faster and more granular insights on advertising performance.

Download the series of papers ['Mapping the future of marketing measurement'](#)

Look out for these subsequent modules in the 'Marketing Measurement Innovation Series' to be released soon:

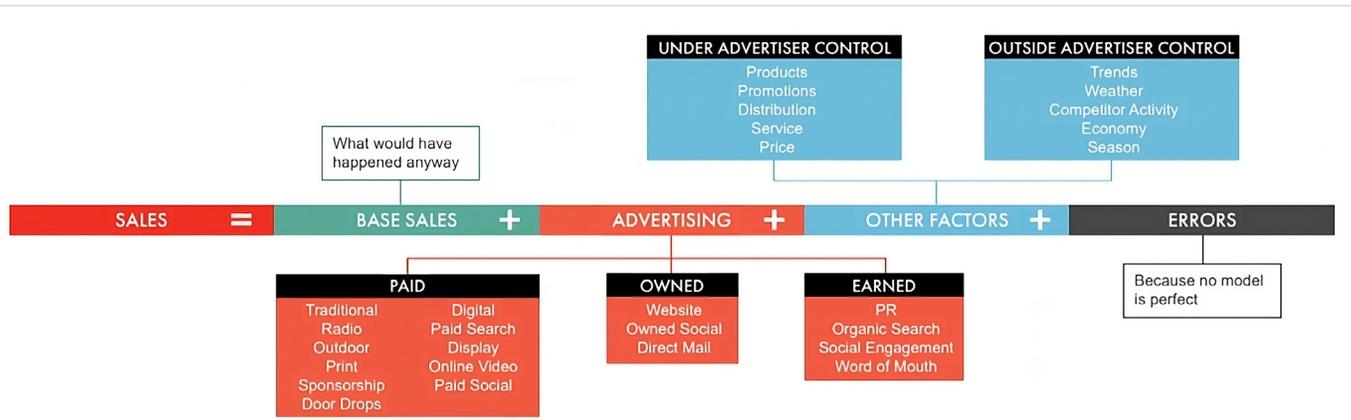
- **Continuing test and learn experiments**
- **Developments in ad attention measurement**

fundamentals of market mix modelling

Market Mix Models inform how marketing inputs translate to incremental sales using econometric techniques. Market Mix Modelling (MMM) is a statistical analysis of aggregate sales, advertising and marketing data, and data on other factors outside a marketer’s control, that quantifies the impact of different marketing channels and tactics (the marketing mix) on financial outcomes over time. MMM is a form of econometrics which predicts how all advertising activity (eg. TV, print, out of home, online video, social media, and search) translates into incremental sales. Incremental sales are those directly attributable to marketing activity and enable marketers to identify and quantify the impact and optimise their investments along with the ability to predict future outcomes.

MMM econometric models take all the variables that might affect sales – from advertising campaigns to the weather to pricing to overall economic conditions - into account. Under the hood, MMM has traditionally used the principle of linear regression to create a sales prediction equation (see figure below) where the dependent variable is sales (left hand of the equals sign) and the independent variables are the marketing inputs (right hand of the equals sign). Marketers can then run the equation to see that if they do X, sales will change to Y. Marketers can use it to show how marketing and communications activities (along with other factors that are not in their control) are impacting aggregate sales and to determine the best marketing mix.

market mix modelling is evolving to provide more granular and faster insights with less data



Source; IAB UK Measuring Digital Advertising in a Multi-Media Context: A Guide and Toolkit

Market Mix Modelling Glossary of Terms

Mutinex have provided some key definitions to get you started:

[Mutinex Market Mix Modeling Glossary of Terms](#)

Foundations of Market Mix Modelling - Online Training

IAB Australia also offer an online training course to help you understand the fundamentals of Market Mix Modelling (MMM) including an introduction to the methodology, when you should use it, how it works and a step-by-step case study example. [Enrol for free.](#)

Business questions that can be answered using MMM

MMM can be used to assess the impact of many marketing and non-marketing factors, helping to answer a range of business questions from strategic budget allocation decisions to marketing contribution insights for the marketing team and to more granular tactical media and advertising decisions for media planners and creatives.

Below are some examples of business questions that could be answered by MMM, the possibilities are far greater. Marketers undertaking MMM need to be focused on measurement objectives and priorities, no single project will be able to address everything. Also, they will need to understand the granularity and accuracy of data they have access to that will enable them to answer their specific questions.

Example business questions that can be answered using MMM

Budget	Marketing	Media	External
<p>What overall return on investment did marketing and comms deliver?</p> <p>What is the optimal marketing plan to maximize future profits given our current budget, or a future budget?</p> <p>How do changes in marketing activities impact profitability?</p> <p>How should our future marketing budget be allocated among marketing tactics and campaigns?</p> <p>Which geographies, channels, consumer segments, ...have the largest lift and MROI?</p>	<p>Which marketing tactics and campaigns have the best MROI?</p> <p>What is the incremental impact of my marketing activities on baseline sales?</p> <p>What is the most sales effective and efficient marketing tactic for a given demographic segment?</p> <p>What is the impact of a price change on sales and profits?</p> <p>What impact have new product features made?</p>	<p>What is the ROI of the spend of my media mix?</p> <p>How can I optimize my marketing mix and media mix?</p> <p>How does online vs offline media contribute to my ROI?</p> <p>What is the best media environment to use?</p> <p>Which type of media flighting is best? Burst, Pulse or Always on?</p> <p>What's the consumers' media retention rate for each campaign?</p> <p>How is my advertising affecting consumer price sensitivity?</p> <p>Are there synergies across media?</p> <p>How effective are different ad creative or message types?</p>	<p>What is the ROI of the spend of my media mix?</p> <p>How can I optimize my marketing mix and media mix?</p> <p>How does online vs offline media contribute to my ROI?</p> <p>What is the best media environment to use?</p> <p>Which type of media flighting is best? Burst, Pulse or Always on?</p> <p>What's the consumers' media retention rate for each campaign?</p> <p>How is my advertising affecting consumer price sensitivity?</p> <p>Are there synergies across media?</p> <p>How effective are different ad creative or message types?</p>

extracting value from market mix modelling - an agency's perspective

3



Liam Pook | Head of Digital at PHD Melbourne



David Bielenberg | Head of Strategy & Planning at PHD Melbourne

At PHD, we've found that those clients who have successfully integrated MMM as part of their measurement toolkit have driven an average of 5% improvement in incremental revenue within the first two years. Like any measurement tool, it isn't a silver bullet to completely understanding how your marketing has worked but does play an important role within a broader measurement infrastructure in connecting media investment to business outcomes.

Some of the key strengths of MMM are that it allows us to evaluate media performance in metrics such as sales and revenue, which matter to wider business stakeholders. Unlike many other forms of measurement, it accounts for external influences such as weather, sales promotions, and competitor activity; whilst quantifying the incremental impact of advertising above-and-beyond sales that would have happened anyway.

While these are fantastic benefits, there are challenges and limitations. Firstly, insights are often at a high level (eg. campaign or channel level results), so don't enable more granular, tactical optimisation. Additionally, the high cost can be a barrier for clients, and long-lead times (MMMs typically need 6-48 months' data) mean that the insights don't always align to planning cycles. Data availability is also a challenge for both clients and agencies.

As a first step, we recommend clients work with their agencies to build out a holistic measurement framework to ensure they quantify the impact of media delivery on both brand outtakes (how consumers think and feel) and business outcomes. Agencies will need to work collaboratively with measurement providers to ensure they have a comprehensive evaluation system in place to deliver a continuous cycle of learning.

The ad effectiveness measurement framework

	MEDIA EFFECTIVENESS Improve delivery	BRAND EFFECTIVENESS Impact brand	SALES EFFECTIVENESS Increase sales
TECHNIQUES	<ul style="list-style-type: none"> • Viewability • Media verification • Audience demographic verification • Digital campaign delivery measurement • Cross-media campaign reach & frequency • Attention measurement 	<ul style="list-style-type: none"> • Ad recall tracking • Brand-lift • Brand equity measurement 	<ul style="list-style-type: none"> • Market Mix Modelling • Path to conversion • Multi-touch attribution • Sales-lift • Customer lifetime value
MEASUREMENT	<p>The measurement of audiences reached by marketing communications and the understanding of how efficiently this is achieved. At its core it is the understanding whether valid impressions were served to humans and to what extent those impressions were viewable.</p> <p>There is increasing adoption of attention-based measurement to assess whether a person has seen an ad and for how long.</p>	<p>The measurement of how marketing communications create mental structures (associations, consumer perceptions of brand meaningfulness and uniqueness, etc.) that will predispose potential customers to choose one brand over another (brand building) and how they impact brand recall that may influence choice of products for consumers already in the market (share of mind).</p>	<p>The measurement of how marketing communications affect or influence consumer behaviour in relation to purchasing.</p> <ol style="list-style-type: none"> 1. Long-term effects on brand business growth: impact on sales, profit, market share, penetration, loyalty and price sensitivity 2. Short-term activation effects on shoppers: transactional or intermediate direct responses and conversions (like sign-ups, leads, immediate sales online and offline).
METRICS	<ul style="list-style-type: none"> • Impressions (viewable, fraudless, brand safe) • Target reach and frequency (deduped across devices if relevant) • Size of demographic audience group • Attention time metrics 	<ul style="list-style-type: none"> • Unaided & aided brand awareness • Ad awareness • Brand favourability • Message association • Purchase intent (brand consideration) • Image attributes • Brand equity 	<ul style="list-style-type: none"> • Long-term - Sales penetration, Customer-lifetime value, Return on profit • Short-term - Uplift in sales conversions and leads attributable to communications activity (MTA), Incrementality/sales/penetration lift/return on advertising spend (ROAS)

The IAB Advertising Effectiveness Measurement Framework

Once the need for an MMM has been established, there are a few things we recommend clients take into account before formally kicking off:

1. **Build-in processes and technologies that ensure MMM data is fed into future planning.** Market Mix Models are useless unless the insight and learning is fed through to planning teams and informs channel selection and budgets. At PHD, our central planning tool – Omni Studio – is set-up to ingest client (and category) MMM data, which automatically generates reach and revenue curves for client campaigns. This ensures PHD client plans are optimised according to regularly refreshed MMM data, which drives outcomes.
2. **Clarify roles and responsibilities upfront for data collection and sharing.** Data accuracy is critical to MMM success and will often require the creation of a cross-functional team to extract, QA and share channel performance data. Pre-existing relationships can help expedite this process, especially where media agency and MMM teams are seated in close proximity with one another.
3. **Ensure senior stakeholder buy-in.** Over time, we've had to become more comfortable with the concept of using data modelling to measure the impact of our marketing efforts. Clients need to be taken on this journey and understand how shifts in privacy and regulation are impacting how we measure campaigns. Without this grounding, it can be a challenge to gain confidence from senior clients in embracing MMM as a tool.

the industry shift to market mix modelling

4

IAB industry engagements have shown that over the last couple of years, with Apple's move to App Tracking Transparency, preparations for the retirement of third-party cookies and with changes to privacy legislation imminent, advertisers and agencies are increasing their usage of sustainable measurement techniques (including Lift Studies and Market Mix Modelling). IAB industry engagements have also reported advertisers and agencies decreasing their usage of attribution measurement techniques which, with the decrease in available data signals, are far less accurate when used in isolation from other techniques.

Market Mix Modelling is not a new technique but is experiencing a revival and evolution. The following outlines some of the reasons for the recent industry shift to Market Mix Modelling.

Privacy compliant, sustainable measurement

MMM deals primarily with de-identified and aggregated data sets, so the new privacy landscape and legislation in Australia is likely to have a minimal impact on the efficacy of the technique.

The digital media exposure data that is typically used in MMM is impressions, clicks and views. Viewable impressions are preferred. Whether digital media is bought programmatically or direct, ad servers can provide impressions, clicks and views, without the need for cookies. The removal of third-party cookies will therefore have little or no impact on the data used to measure digital media using MMM.

Most models will continue to take advantage of the data partnerships already in place that provide rich platform level data to inform the analysis undertaken. It is worth noting that first-party cookies will still operate, and media owners will be able to use first-party cookies to provide visibility of measures such as reach and frequency.

Greater restrictions and phasing out of device IDs and third-party cookies have already had a significant impact on measurement, particularly the attribution technique, which has led many to ask questions like how much data is now missing and what's the damage of this missing data in making decisions?

Watch **Paul Sinkinson, Managing Director Australia at Analytic Partners** present research at the IAB's MeasureUp 2023 quantifying the difference in ROI when using a typical attribution model compared to what clients would see using Market Mix Modelling.

- IAB MeasureUp 2023 - [It's worse than you think: attribution is doing more damage than good](#)

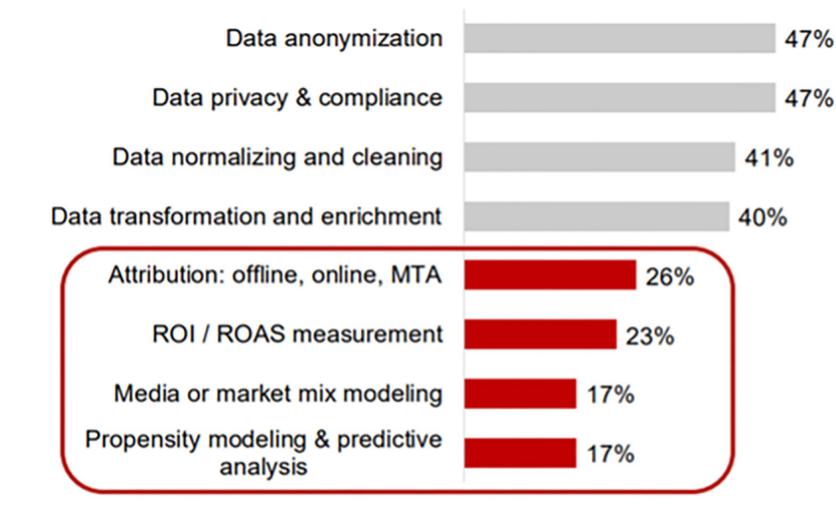
Data clean rooms facilitate privacy preserving data collaboration

A data clean room is an example of privacy-enhancing technology which can provide a secure collaboration environment allowing participants to leverage data assets for specific, mutually agreed upon uses, while guaranteeing enforcement of strict data access limitations, for example not exposing personal data.

Data clean rooms can be particularly useful when multiple stakeholders (advertisers, publishers, and data providers) need to collaborate on the MMM project. Data clean rooms can be used to safely ingest the relevant data (eg. sales data, marketing expenditure data etc), provide a secure and controlled environment for data scientists to work with this data and even perform the MMM analysis, as well as transferring aggregated results to external stakeholders. Data clean rooms can be a space where data can be shared by a party that wants the data only to be available by the model but not by the company building the model.

The IAB Australia [Data Council's Data Collaborations Platform Explainer](#) provides best practices, guidance, and comprehensive definitions in the area of compliant data collaboration for the purposes of digital advertising. The [IAB Australia Data and Privacy State of the Nation](#) industry survey reported that Australian advertising decision makers involvement with Data Clean Rooms is at the exploratory stage with 53% of respondents implementing, testing or exploring this solution. The chart below outlines the usage of data clean rooms amongst US brands, agencies and publishers.

Uses of Data Clean Rooms amongst US data decision-makers at brands, agencies and publishers



Source; [IAB US State of Data 2023 Report](#), research conducted with Ipsos

Q - Please select all of the reasons you/your client are using the following technology. – Data clean rooms

As Data Clean Room solutions begin to mature, the industry must come to a consensus on how Data Clean Rooms operate, develop a set of canonical use-cases, and standards around data processes and input-output formats.

The IAB Tech Lab's '[Data Clean Rooms: Guidance and Recommended Practices](#)' document provides a set of common Data Clean Room principles, marketing and advertising use cases, and operating recommendations.

Holistic measurement

Media fragmentation and the increasing number of media options available have driven marketers to look for measurement solutions that capture the impact of full cross-media activities. Combined multi-channel approaches drive higher ROI, so it's important for marketers to understand the holistic view including synergistic impacts across media.

MMM can predict how all advertising activity (eg. TV, print, out of home, online video, social media, and search) translates into sales ROI. Models can include the impact of factors outside the advertiser's control such as the economy and the weather. Models can also provide a full-funnel view (not just impact on sales) by modelling for a range of other KPIs such as brand and brand equity related metrics.

Outcome-based measurement

Outcome-based measurement ties media performance to the metrics that are crucial to a business' growth. This enables marketers to assess the performance of their media investments with clearly defined financial-related metrics.

Market Mix Models also recognise that different media campaigns drive different outcomes, and as mentioned above, models can also incorporate the impacts on other KPI's including impact of media on the upper funnel brand or brand equity.

Incremental measurement

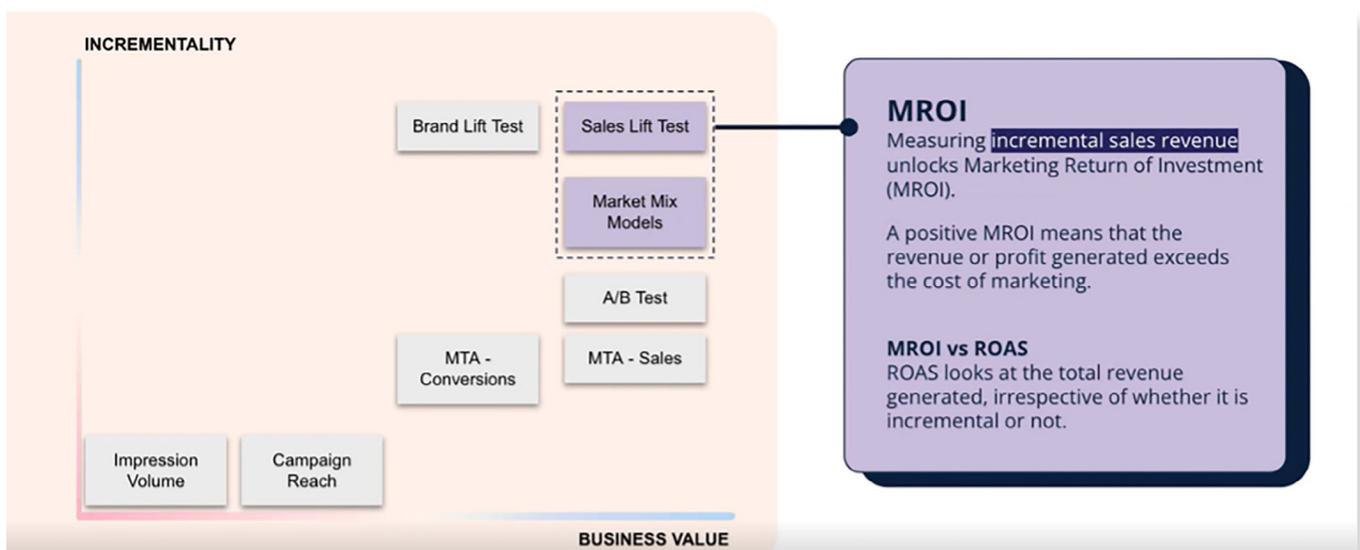
Incrementality identifies the impact delivered above what would have occurred without the marketing activity and plays a crucial role in understanding the true impact of marketing activities and optimising marketing strategies.

Incrementality is often used to establish causal relationships. Controlled experiments (such as sales lift and brand lift studies) offer the gold standard in the assessment of causality, the direct impact of marketing efforts.

Controlled experiments compare the performance of exposed groups (those who were exposed to a marketing campaign) with control groups (those who were not exposed), so you can infer whether the marketing campaign caused the observed changes in outcomes.

MMM often incorporates the concept of incrementality, sometimes referred to as "incremental analysis". There are ways to test for causality within MMM to provide estimates of the incremental value of each marketing channel. Combining MMM with controlled experiments (such as geo sales lift experiment) can also be used to identify incrementality.

lift studies and market mix modelling provide privacy-centric and incrementality focused solutions



Source: Mutinex

Faster and more granular insights

MMM works with more granular data than in the past, taking advantage of more sophisticated modelling techniques. MMM has seen evolution in recent years thanks to the power of cloud computing, bringing the speed of insights down from months to days. Advancements in machine learning and computing power have resolved some of the common complaints of MMM, like timeliness and providing the capability of drilling down into more granular drivers of performance such as creative, format and geography.

The balance between completeness and quickness/agility is one of the most important decisions to be made before starting any MMM project.

considerations for undertaking market mix modelling

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Market Mix Modelling requires resources, careful analytic design, proper implementation, and expertise to interpret the results and apply the learnings to future plans.

Here are some key considerations for marketers undertaking MMM.

Data Collection

The biggest hurdle to timely delivery of insights from MMM is often delivery of accurate data (most forms of MMM use aggregate, not user-level, data). The pain points tend to lie in capturing adequate historical data. A robust data collection plan is important. You will have heard the phrase, “garbage in, garbage out”, which certainly applies here, and data quality, volume and granularity are important considerations when undertaking MMM. Generally, the more data and more granular data you have, the more accurate and reliable the results will be.’

Also, variation in media mix and input variables is preferred in order to identify what impact each variable has. Generally speaking, MMM requires roughly three years of historical data across the following types of data:

- Historic sales and revenue with as much granularity as possible
- Marketing expenditure on all your marketing activities
- Advertising expenditure across all media channels used
- Pricing strategies
- Measures of brand awareness and perceptions of your brand, for example from your brand tracking study
- Market share data for your brand and competitors
- Consumer data, such as demographics, customer segmentation data, can be used to refine the analysis (handled in a privacy compliant way)
- To understand how external factors influence sales, your MMM vendor can provide data on economic indicators, seasonal trends, competitor activities, and any other external variables that could influence sales

Scale

For MMM to obtain results that are meaningful and actionable, the marketing investment needs to reach a certain scale. While most people agree with this concept, there's no agreement upon a minimum threshold.

Budget

While the cost of implementation and support vary, cost is one of the often-cited barriers for Market Mix Modelling. There are a range of research vendors in the market you can brief on your project, be clear with them about your priorities and evaluate the potential return on investment.

Clear guidance

It is common practice for marketers to use an external research partner for MMM as it is difficult to build valid and robust models without clear guidance, however many open-source MMM tools are becoming available that can be a cost-effective and flexible choice.

Clear guidance and expertise are required in the following areas:

- deep knowledge and experience in statistical analysis, econometrics
- handling large datasets and complex models
- benchmarking data to compare performance against others in the industry
- compliance with data privacy regulations
- quality assurance processes
- creation of documentation and reports for your organisation to understand and act upon the findings

Calibrating with experiments

Marketers are learning how to integrate multiple measurement tools as there is no silver bullet, no one technology, methodology or metric that will alone provide the full picture of marketing effectiveness and ROI. Successful, sustainable measurement requires adjustment in measurement frameworks to aggregate multiple techniques and data sources and synthesising into an overall view of performance. Marketers can calibrate across these different measurement techniques to gather complementary insights for a holistic view and implement solutions where they differ.

Calibrating Market Mix Models with experiments helps validate and fine-tune the model's accuracy and effectiveness. Gold standard, controlled experiments provide real-world data on the incremental impact of campaigns and how a strategic change in media (such as an audience segment, ad creative, media channel or frequency level) results in an impact on success metrics. Experiments can be conducted with speed and offer high accuracy. Ongoing experimentation allows marketers to gather feedback on media strategies based on evidence and check models against the ground truth to fine tune models.

industry perspectives on the evolutions of market mix modelling

6

MMM: Challenges and Opportunities



Amir Jangodaz | Marketing Mix Model Lead at Google

MMM, or Marketing Mix Modeling, is a 50-year-old marketing analytics technique that is taking centre stage in response to new privacy expectations and government regulations. There is a renewed interest in econometrics as a core approach to measuring media effectiveness.

Previously, MMM was used by omnichannel and FMCG brands that invested heavily in traditional media channels to help measure the impact on offline sales. However, as the phasing out of cookies makes it more difficult to track users across channels, there has been an emerging trend amongst online pure players adopting MMM to form a more complete picture of media effectiveness.

The measurement industry has become more democratised in recent years too. There are now more options available to advertisers in the MMM space, from large players to newer entrants to open-source solutions.

The variety of MMM solutions available can be confusing for new marketers, who may not know where to start. This can lead to delays in implementation and missed opportunities to improve marketing effectiveness.

Selecting the right MMM path and building a high-impact collaboration requires insights into your company's unique needs. Partners and solutions differentiate by methodology, technology, and services.

However, there are **several aspects of MMM that are consistently appreciated by most advertisers in this new AI world:**

1. **Begin with business questions and then choose the best approach to answer them.** MMM may not be able to answer all your questions, so identifying the limitations of your planned MMM will help you manage expectations and find complementary solutions.
2. **Different media campaigns drive different outcomes.** While some campaigns drive brand perceptions, others generate leads or drive sales online or offline. Today, it is not uncommon to see MMM built around several KPIs via a model design known as nested models.
3. **Modern MMM increasingly focuses on the multi-functionality of media, measuring impact on outcomes across the customer journey and it can even link media and brand strength to sales.** It is important to be diligent in designing a comprehensive model by capturing all possible outcome drivers and automating the data collection pipeline as much as possible.
4. **The insight is in the details.** Data accuracy and granularity are the foundation of a robust MMM. Split your data by device, target, ad format, marketing objectives and geo as much as you can to generate actionable insights in your MMM. Because, for example, “YouTube ROI for 15-second ads targeting 24-40 year olds on Connected TV in NSW” is more insightful, optimisable and actionable than just the “YouTube ROI”.

A distinctive strength of MMM over other media effectiveness measurement solutions is the flexibility of model design and its ability to include outcomes and drivers that are relevant to the business while measuring all these relationships in the same analysis.

One common point of criticism of MMM is the fact that it is not causal in nature, but based on correlation. There are ways to test for causality within MMM but it can also be identified by combining MMM with other tactics, such as geo experiment or incrementality testing. Such approaches can also help calibrate the incremental volume from MMM. Yet another way to take an MMM to the next level is to enrich the design or the insights with campaign-level measurements such as brand lift studies that measure changes in a brand KPI due to exposure to media on YouTube or Google Search. This approach helps link improvements in brand KPIs to sales.

In summary, MMM is making a comeback but no single tool has all the answers anymore. Brands need a combined approach that leverages each other’s strengths and fills each other gaps, while supporting privacy preserving solutions.

MMM’s potential bias exposed: How to select a model for accurate decision making and ROI **Google and Hakuhodo DY media partners Inc**

To help you identify a model that’ll let you make accurate marketing investment decisions and grow your bottom line, Hakuhodo DY Group and Google pull back the curtain on MMM in this report to help you get the most out of it. [Download the report](#)

industry perspectives on the evolutions of market mix modelling

The Future of Market Mix Modelling: rapid reporting, forecasting and decision making



Henry Innis | Co-Founder and CEO at Mutinex

Product innovations in MMM 2.0

The evolution of market mix has been underpinned by two central themes: accessibility and accountability. As MMM has moved to the centre of measurement conversations, increasingly modernised stacks, or MMM 2.0, has been fuelled by these two trends.

We can see these across **four key areas of MMM 2.0 which have evolved: data submission, product experience, granularity and testing/predictions. Each is fuelling a new product offering which is changing MMM from reporting to decision engine.**

Data submission is being reinvented. Most MMM providers relied on strict data schemas to accept and process data historically. Today, the market standard is to map data from reports. But submission is going even further than that. Increasingly, products around data management and submission will become the norm with opinionated data warehouses underpinning huge automation and structuring of unstructured datasets.

The product experience is being fuelled by granularity. As we gain more insight into the market patterns, it's becoming clear insights down to the format are key. Meta, Google and others have contributed large API feeds to fuel granularity within MMMs further compounding this shift.

Testing and predictions are the final piece of the puzzle. MMMs were previously validated through statistical governance. Today, they are validated by test and learn programs leveraging their assumptions. These programs serve not only to extract value from MMM platforms, but to validate their hypotheses and action in the real-world.

Where do you start in data collection?

No marketer will ever regret collecting data in a weekly time-series. **A very smart MMM provider said recently that you won't ever regret knowing how much you spent in a given week on media.** This holds true for most variables - by collecting in a time-series, you inherently begin to understand your business patterns better than before.

At Mutinex we recommend collecting at a minimum weekly pricing and media spend/reach signals.

These signals inform your business best about how things change over time, which at the very least is hugely informative in a dashboard. This can be levelled up to an MMM as and when you desire.

Making MMM fit for purpose

In a nutshell, rapid reporting, forecasting and decision making are the future of MMM. MMM is moving from the powerpoint deck to the performance marketer in that sense and often driving a performance mindset back into the marketers themselves as a result.

Market Mix Modelling Glossary of Terms - Mutinex have provided some key definitions to get you started: [Mutinex Market Mix Modeling Glossary of Terms](#)

MMM insights - Watch Henry's presentations from IAB's MeasureUp 2023 and 2022 demonstrating how marketers are using quality MMM to navigate tough decisions throughout economic downturn.

- IAB MeasureUp 2023: [MROI shocks: How marketers are using measurement to react to recession](#)
- IAB MeasureUp 2022: [Measuring macro-economic impact to consumer businesses](#)

industry perspectives on the evolutions of market mix modelling

Why MMM is the ROI X-factor: using marketing mix modelling as your marketing effectiveness secret weapon



John Cucka | Head of Kantar Analytics, Australia

Did you know that optimising your media mix using marketing mix modelling (MMM) increases your ROI on average by 20 per cent, leading to a 17 per cent average increase in sales, a 9.2 per cent reduction in churn and a whopping 42 per cent increase in profit¹? If you're not using MMM as part of your marketing strategy then you're behind the times – and in this current challenging trading environment, that's like trying to play pool blindfolded.

Of all the things marketing can do, MMM will deliver the greatest return on investment.

For all the increases in data feeds, processing power and AI-driven modelling tools, the heart of the modelling is in understanding how marketing, media and brands work with consumers and building this expertise into the models. **There are four key ways that MMM taps into this expertise:**

1. Modelling granularity to match consumer decision-making and data availability

Not all categories are created equal. Some have purchase cycles lasting months whilst others have impulse purchasing happening every day. For this reason, Kantar's modelling system goes down to the daily level and can ingest many hundreds of disparate campaigns to understand their contributions to business outcomes.

With this capability comes the key question: is this necessary for your category and is the data available to power the models? But this can only be asked when your MMM system can handle the granularity.

1 Kantar Global UMMO database 2012-2023

2. Media doesn't just drive sales, it also builds brands

Brand has long been the softer cousin to the hard metrics of acquisition and sales. Clients regularly ask us whether there is a return on investment to brand building, and if so, how does it compare to other activities? By incorporating brand metrics into MMMs, Kantar's global database reveals that the sales contribution of brand building exceeds the direct sales generated by media by up to 1.5 times. Yes, while 40 per cent of ROI from your media activity comes from driving sales directly, 60 per cent comes from driving sales through building your brand¹. Put frankly, if your MMM does not include brand building, you are likely to under-invest in advertising due to missing out on measuring these returns. But it gets worse; different media create sales and build brands at different rates. Digital, for example, is much more efficient at driving sales directly through targeting people in the decision-making funnel, while TV is much more efficient at building brand with its high production values and storytelling. So, if you fail to account for brand, not only would you under-invest in advertising overall, but you'll also mis-invest with the wrong marketing mix.

3. Creative quality matters... a lot!

Kantar's framework for evaluating copy quality has been developed and refined for decades and is proven to be effective at not only evaluating and refining ads in development, but also as part of the MMM modelling process. For some businesses, the number of pieces of copy across years of campaigns can be staggering, so it is fortunate that by using our database of hundreds of thousands of ads, we've developed an AI tool that can ingest pieces of copy and provide measures of quality that can be leveraged in MMMs. As a cutting-edge development, the models we've done globally incorporating copy quality have uniformly shown that creative quality is the single most important predictor of media success. The best ads outperform average ads by 50 per cent and outperform the worst ads by 100 per cent. Without accounting for copy quality, models are less robust and more likely to lead to misappropriation of media budgets.

4. All that complexity requires AI-driven modelling power

The above can seem overwhelming, both in terms of the volume of data required and the complexity of the modelling tasks. This is where leveraging the power of specialty AI tools at two key stages of the process makes the impossible manageable. At the front end of MMMs, the data ingestion process is streamlined by leveraging APIs for the large-scale industry standard data and media platforms, and pairs these with an always learning AI system that streamlines and speeds up the data checking and cleaning processes. At the modelling stage, our Hamilton AI modelling engine can take all that granular data, as fine as daily and cross-sectioned as geo-location specific, covering literally hundreds of pieces of marketing activity. Combined, these tools empower an always-on marketing effectiveness platform that enables users to make smarter marketing decisions, faster.

I first started building MMMs over 30 years ago. While many of the core data requirements and modelling principles remain the same, the expansion of these models to incorporate more data in ways that are consistent with how people make purchase decisions – in particular, brand power and creative quality – has been transformative to our model quality and understanding of marketing influence. And it's all powered by ever more powerful data management and statistical modelling systems that are getting smarter by the day.

As exciting as these developments have been, I am even more excited to see what comes next!

1 Kantar Global UMMO database 2012-2023

industry perspectives on the evolutions of market mix modelling

Getting ahead of the media and marketing revolution



Ishraque Khan, | Associate Director - Marketing Effectiveness, Nielsen



Kirsten Riolo, | Head of Publishers and Platforms, Nielsen

Marketing's always been a tough game, but the constant emergence of new channels, declining linear TV audiences, and digital attribution challenges have made it harder than ever. Exposure now takes a back seat to personalisation and optimisation, with successful campaigns in 2023 needing resonance, relevance, and return on investment (ROI), and a holistic way to accurately and reliably measure all of them. According to Nielsen's latest Annual Marketing Report, while 66% of marketers recognise the importance of end-to-end measurement, only 17% feel confident enough to execute on this. Even more worrying, **confidence in calculating ROI across digital channels remains startlingly low in APAC, with only 45% of marketers feeling assured that they'll be able to measure it in a meaningful way.**

In an age of data-driven decisions, that simply isn't good enough. Such a lack of confidence is slowing growth and hampering optimisation solutions, which almost invariably improve campaign results. This is further complicated by the practice of using various martech solutions for cross-media measurement, which is the norm for 60% of APAC marketers. This scattergun approach makes viewing performance, especially against the rest of the industry, particularly problematic. It's concerning then, that the latest Nielsen data shows that 37% of APAC marketers intend to pare back martech spending over the next 12 months.

Developing a well-structured marketing strategy and tailored measurement framework, which incorporates various solutions, like econometrics modelling, such as Nielsen Marketing Mix Modelling (MMM), A/B testing, and attribution are needed in order to better utilise resources and drive success.

The next generation

As we move beyond “walled gardens” and evolve to a new age where optimisation is king, solutions such as MMM are evolving to meet those needs. Any effective marketing tool in today’s environment must be agile, all-encompassing, and granular. It’s about shifting from volume to precision, which is the difference between merely being heard and being effective. This means providing granular models at the decision-making level, ensuring agility to keep up with real-time changes at that level, and encompassing all addressable media spend for maximum optimisation opportunities.

Key to this is the value placed on continuous measurement and the importance of tracking impact throughout the marketing funnel. This agility enables rapid adjustments and differentiates between branding and performance campaigns, refining KPI tailoring, and is at the core of Nielsen solutions, including MMM, in more than 60 global markets.

The path to sustainable growth demands a comprehensive viewpoint and understanding the significance of long-term media influence. It’s crucial to acknowledge that the long-term influence of media, spanning from three months to over two years, can be as substantial, if not more so, than the short-term impact within the initial 0-20 weeks.

Overlooking the measurement of how media shapes future customer consideration - the long-term impact - leaves businesses in a precarious position. Without this comprehensive perspective, the development of a brand strategy that yields sustainable growth becomes a challenging endeavour. **To succeed in the long-run, it’s imperative to measure and understand how media influences long-term customer behaviour and integrate this insight into your brand strategy for enduring success.**

Enhancing Digital Media Precision

Full funnel measurement serves as the cornerstone of effective campaigns, enabling businesses to thoroughly understand and enhance their media strategies throughout the entire customer journey - from creating initial awareness and fostering consideration, to nurturing mid-funnel engagement like web hits, culminating in the critical lower-funnel acquisition or sales phase.

However, staying ahead in today’s ever-evolving market requires more than a single measurement snapshot. Always-on measurement allows marketers with the agility to track monthly or quarterly ROI and make prompt adjustments based on real-world developments. This proactive approach empowers businesses to remain nimble in their strategies and ensures they stay aligned with what’s genuinely driving their business performance, even at a granular level.

On top of this, brands embarking on the intricate journey of marketing should understand that Branding/SEE and Performance/DO campaigns are inherently different. They serve distinct objectives and the KPIs and success criteria must be tailored to harmonise with each strategy’s pillars. This alignment ensures that the metrics used to gauge success accurately reflect the goals of each campaign, allowing brands to optimise their efforts effectively.

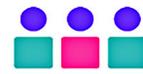
Digital media granularity: modelling and insight

Nielsen has pioneered and initiated the Digital Media Consortium (DMC), in partnership with Google, Meta, and other prominent media players. Its mission? To uncover innovative insights into precisely measuring the ROI of digital and social media strategies (including paid, owned, and earned). Notably, **this research emphasises collecting and modelling data at the most granular levels**. The intended outcome is the precise quantification of digital marketing performance at the most detailed level.

These cutting-edge digital deep-dive models aim to answer crucial optimisation questions within specific digital platforms: Which levers and parameters matter most on a given platform to maximise ROI? Is it campaign duration, reach, ad format, frequency, or placement? These granular aspects often go unaddressed by traditional MMM approaches.

Nielsen's Digital Diagnostic Model (DDM) helps clients answer such granular business questions, often not covered in a full mix model. DDMs are powered by Gradient Boosting Machines (Adaptive boosting) - a powerful machine learning algorithm that deals with data with many variables that can often be highly correlated. **These advancements enable brands to optimise media execution with the same level of detail as attribution. This extends the range of use cases for MMM, supporting both strategic and in-campaign optimization which allows marketers to maximise their media investments and work towards achieving their brand objectives.**

DDM example insights for YouTube:



Objective	Placements	AdFormat	Targeting Type	Campaign Duration	Reach	Frequency
Reach & Brand Awareness	6+ Placements	Bumpers 50-75%	2ndP Affinity	4-6 weeks	Above 3MM	1-3 per week
+73%	+130%	+35%	+18%	+23%	+6%	+29%
Higher average ROAS for Campaign Objective Reach & Brand Awareness than other objectives. Combine for different funnels	Higher average ROAS for 6+ placements than lower number of placements	Higher ROAS for Bumpers in comparison to average YouTube ROAS.	Higher ROAS for 2nd Party Affinity targeting source when compared to average YT ROAS.	Higher ROAS for campaigns which duration is 4-6 weeks compared to average YT ROAS	Higher ROAS for Reach above 3MM users in comparison to average YT ROAS.	Higher ROAS for Campaign Avg Weekly Frequency 1-3 comparing to average YT ROAS.

Role of AI & Machine Learning in MMM

Machine learning and artificial intelligence (ML/AI) are no longer just industry buzzwords - they're pivotal innovations driving media measurement accuracy and granularity. Nielsen's Predictive ROI (PROI) solution utilises such ML/AI to forecast a brand's media plan ROI with minimal inputs, providing faster results, typically within a few weeks, at lower costs compared to traditional MMM.

ML/AI proficiency hinges on expert training to grasp model intricacies and factors influencing outcomes. The efficacy of ML/AI models grows with expansive, robust training datasets. Therefore, while many talk about leveraging these tools, **large organisations equipped with extensive datasets and profound expertise can develop the most potent predictive models through ML/AI.**

Nielsen's Compass database annually bolsters its resources with over 1,500 models, 40,000 curves, spanning 60 countries (representing >90% of GDP), 125 categories, and 500 brands, encompassing approximately \$10 billion in annual ad spend. This allows our PROI solution, which uses Compass as the foundation, to be more precise and accurate.

The key to enabling much of this innovative work is harnessing the power of data to build more predictive models to make smarter decisions, because at the end of the data the most important thing is being able to make smarter decisions that drive business growth. Leveraging ML/AI, but yielding less accurate and predictive results and insights to take action on benefits no one.

Earlier this year 17 senior, respected specialists with expertise in market mix modelling – including Les Binet, Grace Kite, and Louise Cook – published an [open letter](#). While the letter acknowledges the important place for new technology in marketing evaluation, it provides a caution that the algorithms behind some new automated and platform-based solutions could be too simplistic and not properly adapted to the specific businesses being analysed.

Audiences, while consistent, are shifting, and we're now dealing with a media universe of platform nomads, travelling across channels. Whether you're a marketer, an agency, or a brand, you'll need to invest in the latest tools and technology to ensure your message not only reaches your audience but resonates.

As champions of the APAC media ecosystem, our role isn't just to understand the changing landscape, but to shape, it facilitating data-driven decision-making for both strategic planning and in-campaign optimisation.

industry perspectives on the evolutions of market mix modelling

Democratising Measurement with AI and Machine Learning powered Open-Source Techniques



Aimy Le | Marketing Science Partner at Meta ANZ

At Meta, AI has been core to our company's development and the advancements we've made that are powering innovation, cutting-edge research and new tools for creativity and connection. Since 2018, we've spent more than \$90 billion on capex, much of that on building out infrastructure to support growth in AI and AI-based tools, and we expect to spend another \$30 billion this year to increase our AI capacity. AI powers a stronger Discovery Engine (the algorithm that helps users discover new content on Meta platforms) and it helps detect and remove harmful content from our platforms. It also improves ads relevance and automates experiences for marketers, allowing advertisers to drive better results with less time and effort.

Meta also believes in open-sourcing and making our code or stack publicly available to the world, free of charge. You may have heard of existing Meta open source codes, such as the popular machine learning framework [PyTorch](#) and Meta's next generation of open source large language model [Llama 2](#). When it comes to marketing effectiveness measurement, we believe that all advertisers, irrespective of the size of their research budgets, should be able to access high quality and signal-resilient measurement - especially given signal losses in the digital ecosystem and the impact it has on other measurement techniques like attribution.

The Meta Marketing Science team have written and published several Open-Source Techniques (OSTs) that incorporate machine learning features to reduce any potential human bias that comes with measurement, simultaneously increasing the speed and agility of running such analyses.

Machine Learning in Market Mix Modelling (MMMs)

One of the most popular Marketing Science OSTs is Robyn, our open-source MMM code. Robyn can be used to run in-house MMMs and comes with detailed documentation and step-by-step guides to assist with implementation. It incorporates contemporary methodologies based on the latest MMM research, where it aims to reduce human bias in the modelling process.

One of the key features of Robyn is the use of machine learning to automate decisions that MMM analysts historically would have to make when building the models - decisions such as how much carryover effect a media channel has in subsequent time periods (adstocking) or how quickly a media channel approaches diminishing returns (saturation). In Robyn, this is handled by another Meta AI library Nevergrad, which conducts “automated hyperparameter optimisation with evolutionary algorithms”.

In layman’s terms, Nevergrad iteratively tests different adstocking and saturation hyperparameters, where it learns over time as more iterations are run. Ultimately, Robyn can take thousands of models and narrow it down to a couple of models with hyperparameters that best fit the data. While human intervention is still required to select the final model, the use of machine learning has reduced the need to manually and subjectively select the hyperparameters - speeding that part of the modelling process and enabling marketers and analysts to invest more time into other areas.

Machine Learning in Geo-based Incrementality Testing

Another popular Meta Marketing Science OST is Geolift, our open-source code to measure the incremental impact of a campaign at the geographical level. In Geolift, ads are shown to the test market, no ads are shown to the control market and the sales/conversions across the two markets are collected and analysed to measure the incremental lift due to the ads:

Historically other geo-based measurement solutions like Match Market Tests can be subject to bias, as the likelihood of finding exact matching test and control groups can decrease rapidly with limited historical data and multiple variables to control for. For example, measuring the impact of an AFL campaign by using Sydney and Melbourne as the test and control markets is likely to have bias, due to the inherent differences between the two. One of the key benefits of using Geolift over other solutions is that it incorporates machine learning techniques, specifically Augmented Synthetic Control Methods (ACSM), to de-bias any natural correlations caused by underlying differences between the two markets.

Using historical data prior to the treatment, ACSM works by finding a combination of markets that most closely replicate the test market and creates an artificial or synthetic control market. The idea being that the test and synthetic control are virtually identical prior to the treatment, and therefore any differences after the treatment started between these two units is the campaign’s incrementality. Previous methods could involve looking at data of hundreds of different postcodes to determine the best test and control markets. On the other hand, ACSM can take hundreds of different postcodes and narrow it down to a couple of test and control market combinations. Similar to Robyn, human intervention is still required to select the final markets - however the market selection process is mostly automated, speeding up the analysis and freeing up marketers and analysts’ time for other areas.

There is no doubt that AI and machine learning are making their mark on the world. The growth of these technologies is evident in their widespread adoption, driving innovation across sectors and promising even more advancements as computing power and data availability increase. What's promising for our industry is that AI and machine learning are being integrated for more robust, accurate and faster measurement, as evident in Meta Marketing Science OSTs. The beauty of these OSTs means that you can also download and start leveraging Robyn and GeoLift today!

other resources

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