ANALYTIC EDGE
SHARPER INSIGHTS

AUTOMATION AND MARKETING MIX MODELLING

Balancing AI with Human Judgment to Deliver the Best in Marketing Analytics

Artificial Intelligence (AI) in marketing analytics has been a hot topic for some time, and particularly more so in recent months. 17 marketing measurement experts from leading analytics firms published an open letter on the risks of relying on Marketing Mix Modeling (MMM) systems powered by AI. The letter highlighted potential issues with the algorithms powering these automated models. It argued that AI isn't enough to build reliable models and that real people with the right industry expertise are needed.

While it is true that human judgement is critical to building models, it is equally true that AI has huge potential to make MMMs more agile, accurate, cost-efficient and scalable compared to what is possible today. At Analytic Edge, for example, we have been working on leveraging the possibilities of AI and automation at various stages of the MMM process e.g., data ingestion, data validation, modeling, reporting and forecasting – and the results have been quite exciting. Time to insights has, on average, reduced by as much as 30% to 40% along with significant improvements in accuracy and quality of insights. Here's are some examples of how different AI techniques are helping improve MMMs for clients.

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Sebastien Jeanneret, CMO & MD, Continental Europe

Data Ingestion

The first step of every MMM is gathering and inputting the data into the system. This is usually one of the longest and most time-consuming steps as businesses get their data (e.g., sales, media spends, in-store promotions, pricing, weather, macro-economic etc.) from multiple sources and in diverse formats.

Our MMM solution uses APIs and ETL processes (Extract Transform Load) connected to the client's data sources to clean and organize raw data before automatically uploading it onto the MMM platform. While the initial setup of APIs and ETLs takes some time and effort, once set up and connected to the MMM data layer, they significantly accelerate the ongoing data ingestion process. This, in turn, lets clients update models more frequently e.g., bi-weekly or weekly and leverage our NextGen MMM capabilities to generate more frequent and granular insights.

> Analytic Edge uses APIs and ETLs to clean, organize, and automatically upload data onto the MMM platform. This enables more frequent model updates and insights.

Data Validation & Quality Checks

While data is automatically ingested in the system using APIs and ETLs, the MMM platform also uses a built-in AI-powered validation layer to quality-check the data and flag potentially erroneous data and outliers. This is done using AI methodologies such schema validations or rules-based engines, which check the data against rules that have been defined in the platform.

As an example, for a beverages company's MMM one of the variables could be local temperature which would have a defined maximum and minimum possible value. Any data value for temperature falling outside this range would be automatically flagged as an error, with an option for further investigation and correction. Similarly, permissible reference ranges are defined for each MMM variable, and all data is validated against these to minimize errors which might impact validity and accuracy of models.

The system also uses AI rules-based algorithms to identify outliers in the data. Sudden significant spikes or deviations in data values compared to other relative data are flagged as outliers. These are either referred to the marketing analytics team for their judgement and decision or are fixed automatically to fall within the permissible range.

In addition to identifying data errors and outliers, AI algorithms are also used to highlight instances of missing data or data in inconsistent formats for any variable. Together, these AI-driven interventions and corrections ensure the sanctity of the data that is used to build MMM models.

AI-Driven Data Validation

- Advanced data quality checks
- Outlier detection
- Real-time error detection
- Automated anomaly identification
- Missing data identification

Auto Modelling

The first step in modelling is to choose the right variable transformation for every independent variable. For example, for media the variable transformation is ad-stock or gamma transformation, for pricing it could be lag etc. This process has typically been done manually. Now, based on the classification of each variable such as media or pricing etc. a mix of rule-based and AI algorithm engines automatically assigns the appropriate variable transformations. This not only significantly reduces the time required for this step but also prevents human errors.

In the next step, AI algorithms are used to guide and accelerate the modelling process. Considering all the independent variables or business drivers, their causal relationships with the KPI, and the available data, the MMM platform uses what-if scenarios to generate thousands of possible equations (or models) to forecast or simulate the KPI using the independent variables data. Machine Learning (ML) algorithms are then deployed to rank-order the model iterations and shortlist the best models that satisfy key statistical validations such as minimizing MAPE (Mean Absolute Percentage Error) and maximizing R-Squared (a statistical measure of how close the data are to the fitted regression line). The algorithms also enforce business rules and validations based on our industry-specific domain knowledge repository and 'driver vs. impact' benchmark data from thousands of prior MMMs. The above steps are used to select a handful of the most appropriate models to be proposed to the client.

AI for Auto Modelling

- Automatic variable transformation
- Heuristic-based model selection
- Auto business validation enforcement
- Optimized hyperparameter tuning

Reporting & Optimization

Finally, the reporting module of our MMM solution uses AI to make reporting and optimization fast and intuitive for maximum actionability. With ETLs in place for data ingestion, the always-on reporting feature generates completely automated monthly or weekly reports as needed. AI algorithms use model results in conjunction with anonymized results from thousands of industry specific MMMs to generate reports and charts and provide comparative analysis vis-à-vis the industry or the client's own benchmark results. For example, it can determine if current ROI from the MMM is high or low compared with results from previous quarters or years, or vis-à-vis other similar products in the client's portfolio. Reports can be published to external systems and can be customized using tools like Tableau and Power BI.

Other features such as conversational AI-based reporting using generative AI are in the pipeline. This can guide clients in decision making and optimization by conversationally answering questions such as – What will be the change in contribution if I increase advertising spend on Channel X by 5%? Is an ROI of 1.2 a good ROI for brand Y? How has my brand's ROI evolved over the last 2 years?

> AI-driven always-on reporting generates completely automated monthly or weekly reports, plus comparative analysis vis-à-vis the industry or the client's own benchmark results. Features such as conversational AI-based reporting using generative AI are in the pipeline.

Conclusion

At Analytic Edge, we are excited to explore and work with the possibilities that AI has to offer in the area of MMM and marketing analytics. Human judgement and experience will continue to play a critical role in ensuring the validity, sanctity and quality of MMMs. And, as with every new or emerging technology, the potential risks must be navigated carefully and thoughtfully. But there are also numerous opportunities and benefits that AI can deliver including making MMMs faster, more cost-efficient and more easily scalable. It can also make MMMs more accessible and easier-to-use for marketing teams without the need for in-depth statistical expertise. Our NextGen MMM solution DemandDrivers™ is already delivering many of these enhanced benefits to clients globally. Write to us at info@analytic-edge.com to find out how you can use AI-powered MMM to maximize your marketing Return on Investment (ROI).

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About Analytic Edge

Analytic Edge is a global analytics company that leverages technology and advanced analytics to help companies make data-based marketing decisions. The company's flagship platform Analytic Edge Qube offers a suite of marketing analytics solutions with a Software as a Service (SaaS) model. The solutions include DemandDrivers™ for always-on Marketing Mix Modeling (MMM), SynTest™ for AI powered Test and Learn, PriceSense™ for pricing and promotion analytics, and PowerView™ for analytics visualization. Analytic Edge works with clients across industry verticals such as e-commerce, mobile apps, gaming, consumer packaged goods, retail, automotive and many others. The company has offices in Singapore, India, US, Mexico, Brazil, UK, Switzerland, China, Japan, South Korea, UAE and Australia.

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