Ekimetrics.

Advanced Study:
Measuring YouTube ad creative quality impact at scale

Contents

This study aimed to measure the impact of ad creative quality on YouTube specific video performance. The purpose of which was two-fold:

a) Highlight the broader opportunity for the industry to invest in measuring creative effectiveness, and

b) Develop a methodology to understand and measure media creative effectiveness in a repeatable and scalable manner.

The study was able to establish that creative execution is a significant driver of a campaign's sales performance.

This study was independently conducted by global leader in data science solutions for business Ekimetrics, with the participation of YouTube owner Google.

Framing the problem

Despite a consensus that creative plays a key role in campaign performance, there have been few initiatives to quantify its exact impact across media tactics. Further, creative remains absent from most, if not all, media measurement methods today.

The lack of consistent structured creative assessment across the industry and the perceived subjectiveness of why creative appeals to consumers have limited marketers' ability to perform creative measurement at scale. Consequently, it remains an untapped opportunity for most.

While prior studies focused on YouTube have shown that optimizing the use of creative best practices could lift sales and ROAS by 31-38%[1], creative effectiveness research remains limited. In particular, creative effectiveness has yet to be included into the industry-accepted approach to holistic media measurement, Marketing Mix Modeling (MMM), as advertisers and MMM practitioners lack a clear understanding of the set of tools and methodologies required.

Finding the Solution

To establish a reproducible and deterministic framework for creative measurement, this study relied on a set of objective creative criteria derived from previously validated creative principles by Google, known as the ABCDs ("Attention", "Branding", "Connection", "Direction") of effective creative on YouTube.

The project leveraged YouTube videos activated by a cross section of advertisers to establish the link between creative attributes and YouTube advertising performance as measured by Marketing Mix Models (MMM). We used video impressions from over three years, across four different brands, totaling over 2.4B impressions and $21.4M spend.

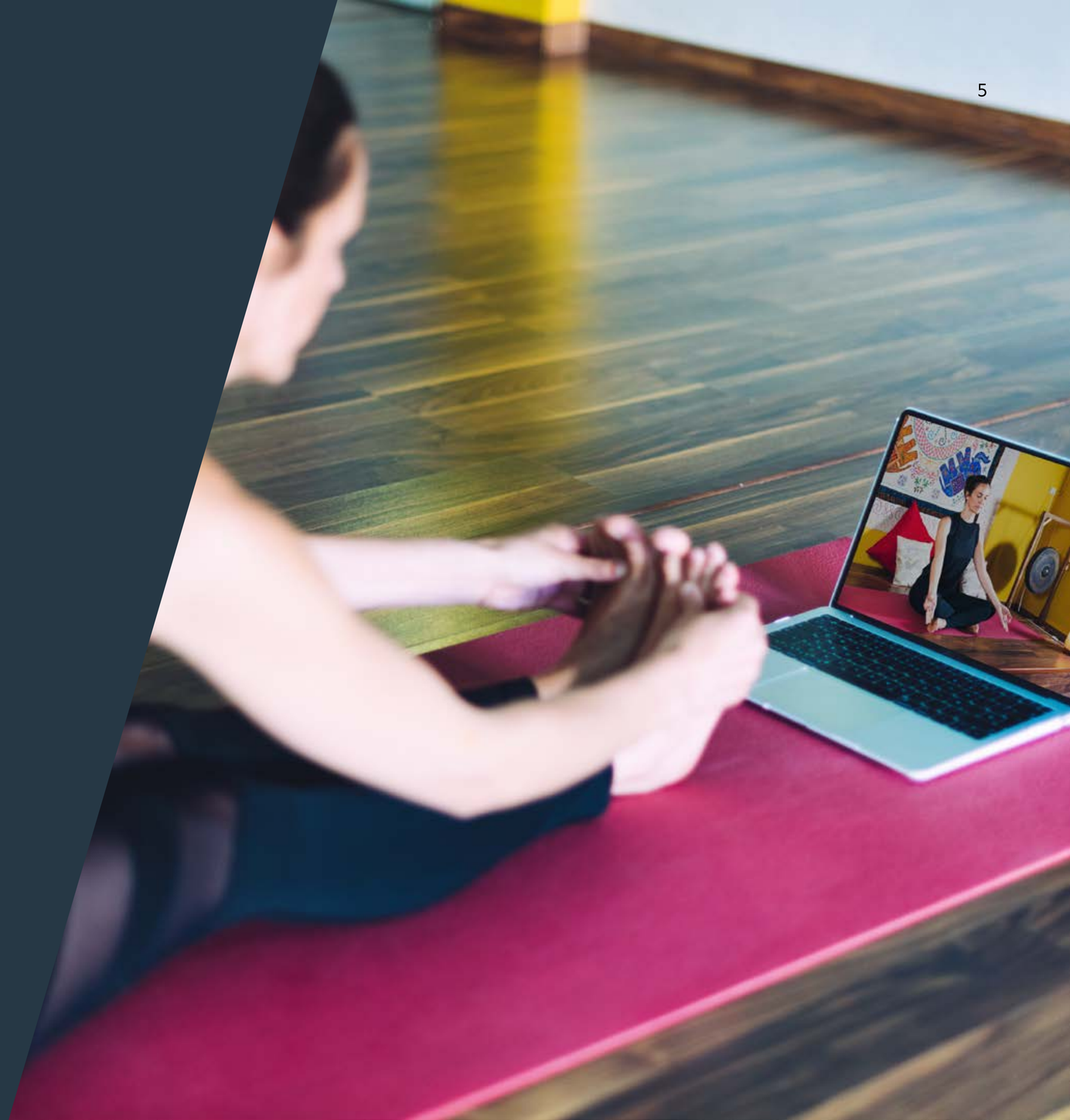
It established a methodology for including creative measurement into MMM, enabling marketers to quantify the impact of this important variable and improve overall model predictive power.

We also explored the uplift driven by the inclusion of individual creative features, giving advertisers an actionable priority list for improving their creative performance. Additionally, to fully leverage these results, we have provided a "creative score" formula for advertisers to track their brand's progress towards creative improvement and describe a measurement framework that quantifies the ROI gain of improved creative scores.

1 In custom US and South East Asia MMM meta-analyses commissioned by Google in the CPG category, Nielsen found that optimizing the use of ABCDs guidelines resulted in +31-38% improvement in sales lift and ROAS on average vs non ABCDs-optimized ads

Key findings[2]

Using the 73 different creative attributes of Google's ABCDs guidelines for effective ads on YouTube, identified and proven through years of research and one of the most extensive lists in the industry today, we quantified the features that are most important in driving performance.



2 Study findings leverage 3+ years of YouTube MMMs ROIs across 4 different brands in beauty, luxury and automotive along with their creative data.

1. You can increase your Video ROI by 2.2X through optimizing creative

When exploring creative and format variables, 60% of overall YouTube sales contribution variation can be explained by creative features. By improving these features, moving creative from “poor” to “optimal”, brands can expect to lift **ROI by 2.2x.**

2. 20 attributes to focus on to determine creative quality

Not all creative levers are created equal. In fact, **80%** of creative-driven sales performance is explained by the top 20 creative features.

Distilling creative quality to fewer attributes makes it easier for brands to scale their own creative measurement and focus their optimization efforts.

3. Use of ‘compelling calls to action’, ‘sound attributes’, and ‘product in context’ are the most effective yet underused creative elements

Inclusion of “Direction” elements increased **ROI by +1.4 pp by attribute on average**, with the most effective “Direction” attribute being a relevant call-to-action (+2.6 pp on ROI).

Example 1:
Make sure your call-to-action relates to the product or offering. Leverage the power of discounts, special offers and sense of urgency to turn viewers into customers.

Before following best practice:

After following best practice:

Executive summary

Relevancy was measured overall to have a strong impact on creative efficiency with showcasing the Product Context having the most important impact on ROI (+2.7 pp on average).

Example 2:
Be upfront, precise and credible when explaining the offering and show exactly how the product will enhance the viewer's life by depicting it in a relevant and realistic situation.

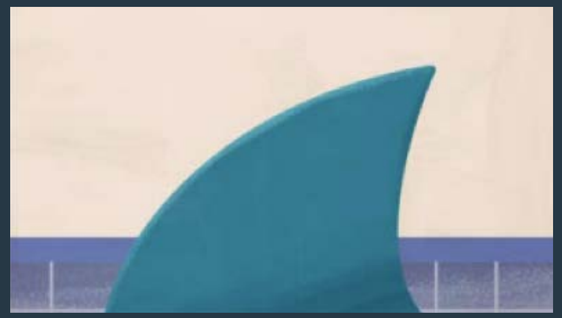
Before following best practice:

After following best practice:

Utilizing best practices related to Sound had **1.8x the share of impact vs visual elements and x1.4 vs text** for reinforcing viewer engagement.

Example 3:
Grab and sustain attention by adding a jingle, sound effects or music.

Before following best practice:



After following best practice:

4. You can increase your MMM's predictive power by integrating creative effectiveness

This study found that by separating YouTube impressions into poor, good and optimal tiers overall model uncertainty decreased, and predictive power increased significantly across all advertisers included in the study.

The decrease in model uncertainty and increase in predictive power occurred despite the two additional YouTube features introduced to model activations by the inclusion of creative features, where typically you would expect model robustness to reduce.

Study background: Establishing the first scalable methodology for creative measurement

Creative execution – meaning the combination of production, message, and overall presentation of advertising content - has always been considered critical for campaign performance; indeed different creatives are often A/B tested.

However, advertisers are looking for more, such as guidance on how to improve creative execution. But to do this, it's essential to be able to operationalize measurement in this perceived subjective space across a multitude of campaigns and executions; and thus far, marketing scientists have lacked a scalable way to do so.

What's more, as tactical elements of digital marketing have almost entirely been automated out of human control through advances in AI and machine learning, the importance of being able to optimize creative quality to gain a competitive edge has increased. With everything from audience targeting to platform placement decided by machines, there are fewer levers of differentiation available for advertisers. Creative execution is the least understood and consequently most important of the remaining levers influencing campaign performance.

So, if we accept that good creative is critical, the question is, 'what makes creative good?' Personal tastes vary greatly, so what one person considers 'good' creative may differ from another's opinion.

To operationalize this subjective field, Google led extensive research exploring thousands of inputs to derive a set of 73 statistically significant objective attributes that drive video ad performance on YouTube. These are known as the ABCD ("Attention", "Branding", "Connection", "Direction") principles.

These principles serve as creative best practice guidelines for advertisers, however the link between these principles and Video ROI is yet to be explored in a repeatable and scalable approach. The ability to quantify the impact of each individual attribute on ROI provides three main benefits:

1.

It quantifies the potential gain in Video performance (as defined by effectiveness & ROI) through creative optimization.

2.

Specifically, it also provides visibility into which of the attributes drive the largest proportions of video performance, allowing for marketing teams to prioritize their creative improvement plans.

3.

It allows marketers to select the subsection of the principles that explain most of creative performance. This provides a smaller scope of best practices for marketers to focus on, minimizing ongoing data collection needs, and enabling a more scalable and repeatable creative measurement program.

Approach

To establish this relationship, we leveraged Ekimetrics' historical database of 3+ years of YouTube ROIs across four different brands in beauty, luxury and automotive, measured by Ekimetrics' MMMs.

We collected data on the creative execution of each YouTube video in this historical period and analyzed the correlation between the presence of each creative attribute and overall Video ROI. Certain other controls that affect Video ad performance were also included in the selection of the most important creative best practices to prevent over-attribution to the creative attributes.

Additionally, we explored the best way to incorporate a "creative score" into MMMs, providing a framework for marketing scientists to implement creative scoring within their own measurement programs.

The Wider Opportunity: The impact of creative on YouTube video performance

Creative execution is a significant driver of YouTube performance. In this study, 'creative execution' is defined as the production, message, and overall presentation of advertising content on YouTube.

By exploring the relationship between creative effectiveness and YouTube video performance, we found that **creative execution is a strong driver of YouTube sales performance.**

Through the analysis of all study creatives and the influence of best practices on efficiency, our research measured that creative execution **explains 60% of video performance variance amongst creative and format variables.**

While reach/frequency, ad format, flighting and targeting are important aspects of any strategy, compelling creative strongly resonates with audiences. By investing in creative excellence, advertisers can unlock significant opportunities to capture the audience interest and increase performance.

Our study found that creative effectiveness drove return on investment by up to **x2.2** and was key in driving conversion.

On average, short-term video efficiency increased by:

- **1.5x** when improving creative quality from poor to good

- **1.4x** from good to optimal

(NB 'Poor' creatives follow less than or 20% of the top 20 creative best practices identified in this study. 'Good' creatives follow less than or equal to 40% of the top 20 creative best practices. 'Optimal' follow more than 40%).

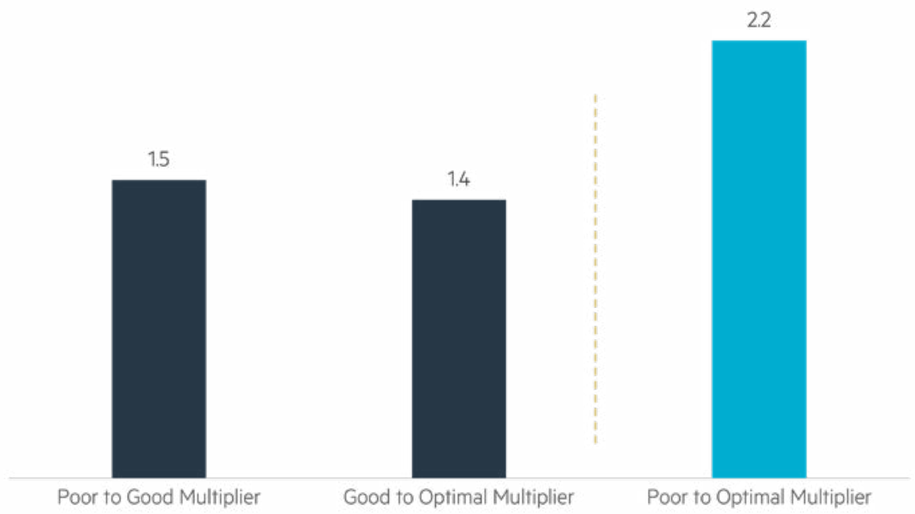


Figure 1: Average ROAS Increases Resulting from Creative Execution Improvement

Additionally, we observed a significant opportunity to elevate creative scores as **58% of videos in the study were suboptimal.** This indicates that the application of the measurement methodology laid out in this study has the potential to yield significant optimization revenue for advertisers who have not rigorously applied creative measurement to date.

As video creative scores improved, we observed some diminishing returns in efficiency gains, yet for each advertiser analyzed, there exists significant potential to improve creative quality, and with it, sales performance.

Three golden rules and 20 creative best practices

Through MMM, YouTube measured performance and video creative content scored against well-defined best practices. We identified the 20 most important creative rules to follow to drive performance differentiation with the potential to boost campaign ROI by 2.2x. We also uncovered three overarching creative recommendations for marketers to follow when crafting their advertising strategy and planning their content.

Three golden rules: Relevant context, audio cues and compelling calls to action

1. Advertisers should provide consumers with a "direction"

Within the ABCD principles, "Direction", which emphasizes compelling calls to action, offers the most potential to improve performance.

While "Branding" is the most adopted principle by marketers - and should remain a focus - its lower average impact on ROI (cf Figure 2 - +0.3 pp) suggests that the untapped opportunity lies in other categories. Advertisers should consider going beyond key branding elements in order to drive additional incremental sales impact.

"Direction" is the least utilized category and with the highest potential impact on video ROI, indicating that creatives with higher adoption of "Direction" principles saw large ROI gains as a result. "Attention" and "Connection" are both more highly utilized but still have potential for ROI growth.

To support widely used "Attention", "Branding", and "Connection" principles, and encourage short-term conversion, advertisers' biggest opportunity lies in including compelling calls to action.

After getting consumers' hard-earned attention, marketers should help viewers by telling them exactly what they would like them to do by providing clear, simply worded calls to action.

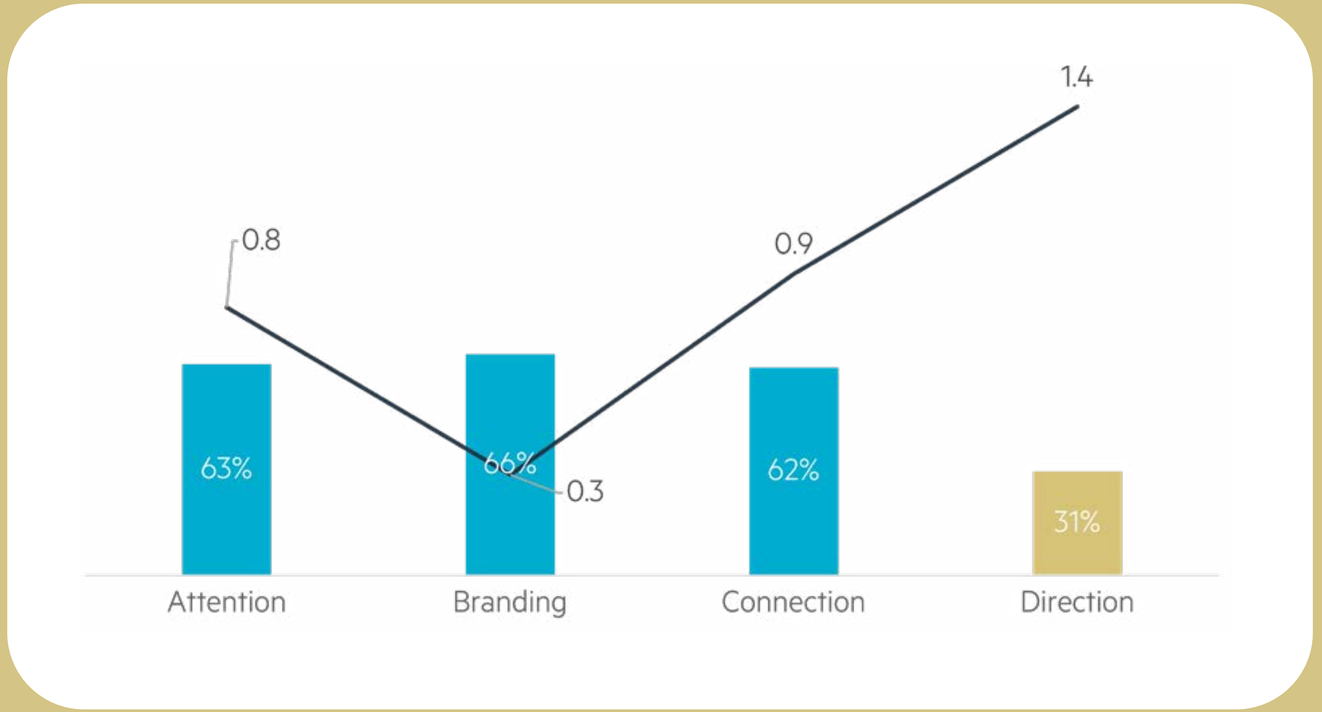


Figure 2: Average Percentage Point Impact on ROI vs Utilization Rate

2. Marketers must unlock the potential of audio cues

By associating creative best practices with their relevant medium of communication (audio, visual or text), we were able to measure the importance of the medium in driving conversion.

Audio - which includes voice over, dialogue, music, jingle, product cues and more - drives the most additional conversions, with

- **1.8x** the share of impact on efficiency vs visual, and
- **1.4x** vs text cues (cf. Figure 3).

While marketers widely use visual and text assets in their creatives, audio is less frequently used (~1.5-1.6 times less likely to be included in a creative vs other cues).

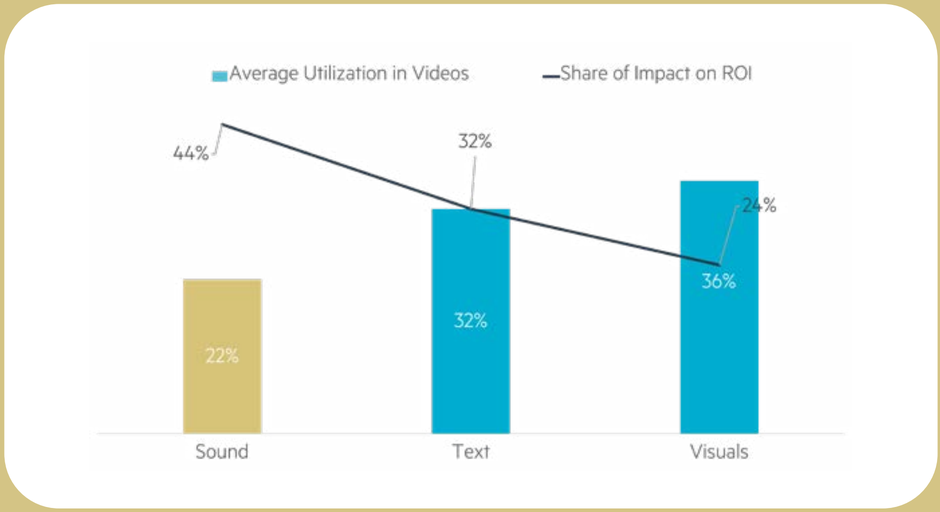


Figure 3: Share of Asset Type Impact on ROI vs Utilization Rate

The challenge for advertisers is to create YouTube content that will resonate and stick in the minds of their audience.

Brands planning their creative strategy should recognize the importance of supporting text and visual cues with sound to enhance the overall viewer experience and increase retention with 'echoic memory'.

While text and visuals also support conversion, leveraging sound is a crucial and often missed opportunity to grab and retain the consumer's attention.

3. Consumers need relevance

In today's digital landscape, a vast quantity of content is fighting for viewers' attention.

In such a saturated environment, our study found that providing relevance to the consumer is the most important aspect in planning creative execution and driving performance.

Specifically, the two best practices measured as having the highest impact on ROI highlight the importance of resonating with consumers to stand out in the crowded YouTube space:

a. Product Context

Marketers should make sure the product and/or service they are advertising is shown in the YouTube video in the context a potential user would encounter.

b. Relevant Call to Action

When providing clear calls to action, advertisers should ensure the CTA is shown after a product, problem or need appears, to ensure the consumer understands the benefits of the brand.

Overall, to increase their effectiveness, advertisers should focus on showcasing what the brand offers, the role its products are designed for and engage with consumers by showing them the "real" context in which this product would benefit them.

While in Google's ABCDs, 'Product Context' is a 'C' – Connection – and 'Relevant Call to Action' is a 'D' – Direction – both relate to a similar importance of showing in context to consumers why the product/service provides value. We'll see next where these features ranked in terms of importance.

20 creative best practices explain 80% of the variation in performance due to creative exectution

Using machine learning to model the relationship between the presence of each attribute and Video ROI, we identified the top 20 features that have the highest importance and impact in predicting video performance. (Figure 4)

Our modelling inputs were:

1. Creative Attributes
73 binary features indicating whether a given creative condition is fulfilled or not by a video. Based on Google's ABCD principles ("Attention", "Branding", "Connection", and "Direction").

2. Controls
Additional features such as format and language that could have an impact on video performance, to avoid attributing their predictive power to creative content.

Various regression models were then tested to capture the relationships between creative attributes and controls with video specific indexed ROIs.

Then, through assessing the impact that each attribute has on video ROI, we were able to quantify the relevant importance of each of the attributes (cf. Appendix 1).

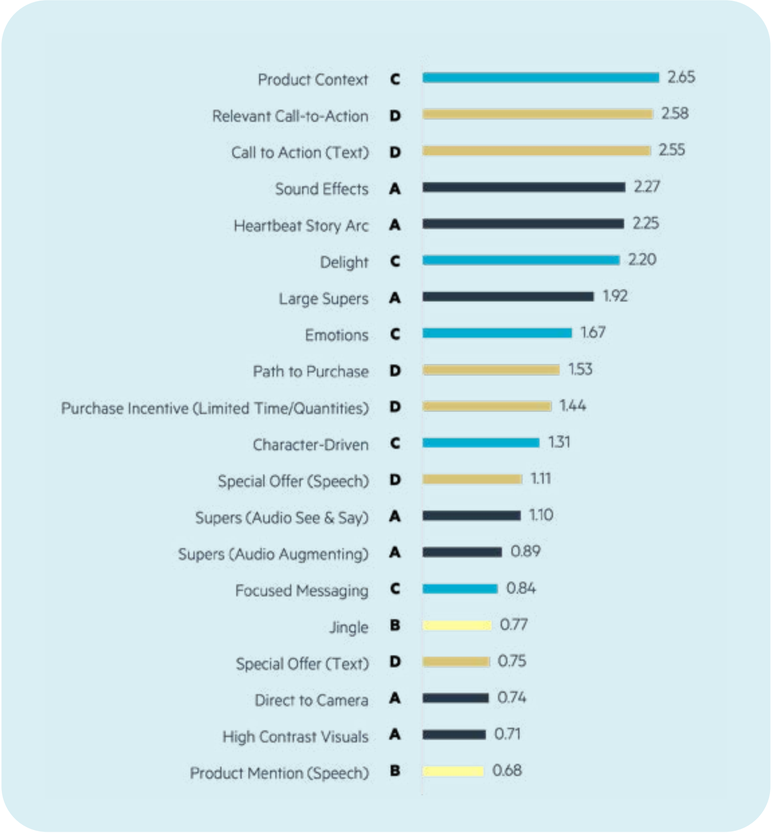
Random Forest was selected as the final model to identify the top 20 creative best practices as it yielded the lowest mean absolute percentage error at 13%.

Those top features not only explain 80% of the creative execution impact on ROI, they also represent all ABCD principles to provide a holistic framework and playbook for marketers to craft and monitor their creative content strategy on YouTube.

Figure 4 highlights a detailed list of the indicators and best practices that advertisers should primarily focus on to improve their YouTube creatives and maximize incremental sales.

By following at least eight of those best practices (the definition of an "optimal" creative being one with 40% of these attributes), marketers can expect up to a 2.2x increase in efficiency due to creative execution improvements and better engagement with the consumer.

Figure 4: Top 20 Features by average percentage point impact on YouTube Video Performance



Google's 'ABCD'[3] principles for effective creative

To understand what specific creative elements resonate with YouTube viewers, Google researchers analyzed thousands of ads to engineer the **"ABCD Principles"**: "Attention", "Branding", "Connection", and "Direction". This study builds upon this work and extracts the most important of these creative rules for advertisers to follow.

Attention

Grab and sustain attention with an immersive story

Successful ads work hard to earn engagement right from the get-go. Of course, there are many ways to do this. You can start your ad in the middle of the action, or open with an arresting close-up. Audio inputs like music, voice-over, and sound effects create a rich, sensory experience that helps people to pay attention. Think about color and contrast to ensure your visuals are bright and strong.

Branding

Brand early, often, and richly

Whether with product shots, pack shots, in situ branding, graphic elements, voice-overs, or musical treatments, work your brand identity into the story. YouTube is almost entirely a sound-on experience, so take advantage of the multisensory aspect of your medium to get more impact.

Connection

Help people think or feel something

Don't think of your viewer as passive. Work to educate, inspire, or entertain them. Humanize your story to help them relate; lean into emotional levers with storytelling techniques such as humor or surprise. But avoid doing too much in your ad. Focus on the message as you make your connection.

Direction

Ask them to take action

Finally, with clear and simple instructions on what to do next, people will be more likely to respond to your ad the way you want. A written call to action, graphics, audio, or even a scene from your story can help guide them.

Our study leveraged 73 best practices derived from the ABCD principles and added granular insights to the framework by providing clear recommendations on which best practices are the most important for driving conversion. We also created a well-defined and scalable framework for marketing scientists to include the latter in traditional MMM measurements.

3 In its "ABCD : Mastering the Art of Effective Storytelling on YouTube" playbook published in 2022, Google helps advertisers understand the ABCD principles and how you can utilize them to engage viewers with your ad.

Establishing a methodology: Including creative exection in MMMs

Having identified and highlighted the broader opportunity for the industry in investing in measuring creative effectiveness, we wanted to develop a methodology to measure creative effectiveness in a repeatable and scalable manner.

Incorporation of a “creative score” into existing MMMs is highly recommended for two main reasons:

a) Better model fit and explanation of sales performance.

b) Ability to quantify and monitor the impact over time of creative execution on YouTube performance.

The following section of the whitepaper provides a comparison of different methodologies to integrate YouTube creative execution into MMM, with our recommended approach being:

– Measure the “creative score” per video (% of top-20 attributes that are present in the video).

– Segment Video impressions into poor, good and optimal to measure their performance separately.

Through this, marketing scientists can quantify the absolute impact on YouTube incremental sales from improving creative execution by measuring the step-change in video performance between creative tiers.

Presenting a scalable framework for integrating creative effectiveness in MMM

The first section highlighted the importance of evaluating creative effectiveness and the impact of improving creative content execution for advertisers. However, despite its importance, creative effectiveness is rarely, if ever, included in MMM for the following reasons:

Data Complexity:
Creative execution is multi-dimensional and, unlike inputs such as impressions, has no numerical MMM-ready format available.

Data Availability:
Very few advertisers currently know how to access creative data. Moreover, MMM relies on historical data to model the relationship between YouTube activations and performance, however “creatives” or ad contents may not always still be available on the platform.

Subjectivity & Lack of Standards:
Creative execution is often still perceived as subjective and too nuanced to quantify. There are also no industry standards/recommendations on how advertisers should establish “quality” of creative execution.

Lack of Knowledge:
Due to the lack of research in this area, there is no established methodology to integrate creative execution into MMMs to perform creative measurement at scale.

Despite these challenges, there is a growing recognition and interest in the importance of including creative execution in MMMs more effectively.

The output from this study provides a replicable and scalable framework for integrating creative effectiveness in MMM measurements.

As no previous methodology has been offered to integrate creative assessment / quality score into MMM measurements, this study pinpointed two approaches to be tested to include creative scores derived in stage 3:

– Using creative scores to **weight** impressions by video

– Using creative scores to **segment** impressions by “creative tier” based on predefined thresholds.

Methodology	Pros	Cons
Weighted	- Granular measurement (distinct weight by video) - Flexibility (ease of adjusting weights)	- Complexity: Difficult to read differences in performance between creatives - Harder to track improvements
Tiered	- Easy to Interpret - Transparent - Scalable	- Lack of granularity - Arbitrariness of thresholds

Table 1: summarizes the pros and cons of each approach prior to diving into the study results and recommendations.

Based on these two distinct approaches, we tested the following methodology:

1. Weighted Impressions
    a. With or without saturation (when no saturation was applied, different scaling ranges were also tested) on creative scores
        i. Using creative scores with selected 20 attributes
        ii. Using creative scores with all 73 attributes
2. Tiered impressions
    a. Two or three-tiered impressions
        i. Quantile or tree-based thresholds
            1. Using creative scores with selected 20 attributes
            2. Using creative scores with all 73 attributes

In total 35+ approaches were tested.

The below performance metrics were used to assess the soundness of each methodology tested:

R-Squared Gain: Comparing new R-Squared with legacy models (total YouTube impressions with no transformations) helps evaluate the improvement / change in the explanatory power of the model.

C.I. Size: Dividing the width of the confidence interval (at 95%) by the coefficient helps to quantify the precision and reliability of the estimate in relation to the uncertainty in the data. A smaller value indicates relatively lower uncertainty.

All features tested were significant across all industries (p-values << 0.05).

Methodology	Pros	R-Squared Gain (pp)	C.I. Size
Weighted Impressions	Standard Score	+0.03	28.3%
	Feature Engineered Score	+0.06	28.3%
	Saturated Standard Score	+0.01	28.0%
	Saturated Feature Engineered	+0.00	27.3%
Two Tiered Impressions	Standard Score	+0.07	28.3%
	Feature Engineered Score	+0.06	28.4%
Three Tiered Impressions	Standard Score	+0.07	28.2%
	Feature Engineered Score	+0.21	25.3%

Table 2: Summarizes key statistics from the 35+ tested approaches. For each sub-section of approaches, we showcase the most significant results.

Tiered impressions using the top 20 creative scores led to the best improvement in model performance.

Given the large number of features and dependent data points usually included in MMMs, as well as the relatively small share of YouTube investments compared to total media budget, a +0.21 percentage point increase in R-Squared is very significant.

By remeasuring YouTube activations with tiered impressions and improving model fit, the average measured absolute difference in YouTube ROI was 25%.

MMM providers should focus on the top 20 features to create a single creative index and use it to segment video impressions into 3 features based on their creative score.

Best Practices and Steps to Integrate Creative Measurement in MMM

Figure 5: Framework for enhancing MMM solutions with creative effectiveness measurement.

Integrating creative scoring in MMM measurements enables advertisers to quantify the potential opportunity in incremental sales.

1. Data Collection

To integrate creative measurement into MMMs, video data must be gathered and impressions and spend should be collected at individual creative level to ensure a 1:1 relationship with the creative content scoring data created in stage 2.

Table 3 details the data that should be collected from the advertiser's preferred data provider or Google. The latter provides a quality-proof, replicable and trustworthy data source.

Data	Type	Source	Content
Video Creative	Multi-dimensional Data	Data Provider OR Google	Video URL along with creative asset
Video Spend & Impressions	Panel Data	Data Provider OR Google	Weekly spend & impressions associated with each YouTube video

Table 3: Data Granularity Required

2. Creative labelling

Once video level data has been collected, advertisers should either use an internal solution or ask their Google representative for a creative labeling solution to evaluate which of the top 20 attributes defined earlier in the paper are present in each video.

Video URL	Focussed Messaging	Direct-to-Camera
Video 1	1	0
Video 2	0	1

Table 4: Example of Creative Labelling

Table 4 provides a quick example of how each video should have a corresponding numerical score (1 = Follows best practice, 0 = Does not follow best practice) for each of the 20 top best practices defined in Figure 4.

3. Creative Scoring

Once all videos have been rated against the top 20 attributes, a single creative index should be computed for each video to provide a unique numerical indicator of creative effectiveness.

Video URL	Attribute 1	Attribute...	Attribute 20	Score
Video 1	1	1	1	1
Video 2	0	1	1	0.67

Table 5: Example of Creative Scoring

Creative scores are computed as a straight percentage of best practices being followed by a given video (e.g. a video has a score of 0.67 if it incorporates 67% of the top 20 selected creative rules).

Using this methodology, MMM providers can easily reproduce and create a single creative score per video to assess the effectiveness of creative execution.

A straight percentage of creative best practices followed out of the top 20, rather than a weighted approach using the average percentage impact on ROI, brings about two main benefits:

a) Ease of generalization

b) Increased robustness against features with high similarity

4. MMM Integration

Split your video impressions into three different features:

– Videos with a Poor Creative: Less than or 20% creative score (4/20 attributes present)

– Videos with a Good Creative: Between 20% and 40% creative score (5/20 – 8/20 attributes present)

– Videos with an optimal Creative: Greater than 40% creative score (8+/20 attributes present)

We recommend that these features are measured in a Bayesian regression, which is advantageous with sometimes sparse YouTube activations due to its ability to incorporate prior knowledge, resulting in more robust estimates and reduced overfitting.

Priors are set using historically measured overall YouTube performance (a benchmark can also be utilized), and prior bounds are tested iteratively to maximize R-Squared gain and minimize uncertainty as well as p-values, with creative tier “poor” having lower bounds than “good”, and in turn “good” having lower bounds than “optimal”.

Presenting a step by step “options menu”: From creative assessment to continuous monitoring

1. Creative Assessment

Quickly assess the value of embarking on a creative measurement program:

a. Requirements

i. Collect labeled creative data for the top 20 creative attributes identified (Figure 4) as explaining 80% of creative driven performance variance.

ii. Classify each creative into a creative tier: poor, good or optimal based on the percentage of the top twenty best practices followed.

iii. Overall assessment of how many videos fall into each creative tier

b. Outcome

i. Assess the current state of your creative execution and get an understanding of the overall creative landscape

ii. Size the prize of creative improvement using the study multipliers to get a first understanding of incremental sales to be gained

2. Integrate scoring into MMM

Derive a unique creative ROI for your brand(s), establish a methodology for ongoing measurement, and build a roadmap for targeted creative improvement.

a. Requirements

i. YouTube impressions and spend at video granularity

ii. Each video classified into poor, good or optimal tiers

iii. MMM YouTube feature split into the three tiers of impressions using Bayesian priors

iv. Assessment of best fit based on Bayesian priors bounds

b. Outcome:

ii. Historical performance understanding of each creative execution tier with specific ROIs for each

iii. Quantify missed opportunity in terms of incremental sales tailored to your brand fi

3. Ongoing monitoring

Steer creative improvement with ongoing measurement and quantify the value of creative improvements.

a. Requirements

i. Streamlined data collection process with ongoing collection of creative scores

ii. Refreshed MMMs with creative features incorporated

b. Outcome

i. Track evolution of creative quality over time

wii. Quantify sales impact of improvements made to creative execution

Next steps to advance the findings and methodology of this study

1. Expand list of control variables

The current selection of control variables was chosen based on data availability at the time of the study. Exploring the addition of more non-creative factors that may affect Video ROI will allow us to improve model performance while also investigating if there are differences in the definition of an “optimal creative” between control groups.

2. Assessment of long-term impact of creative on brand image

By focusing on the impact of creative quality on ROI, we are capturing the short-term gains driven by higher quality videos. However, there is highly likely to be additional longer-term gains from consistent creative strength driving improvements in brand image. This analysis poses itself as a natural next step in the aim to develop a full picture of creative impact.

3. Track the evolution of attribute importance over time

The current attributes were evaluated by their impact on ROI across the full 3+ years of data in the analysis period. Further investigation into the importance of these attributes over time would allow us to see if any “creative wear-out” exists, whereby optimal creatives only remain optimal for a given length of time.

Apendix 1:
Random Forest Methodology

The top 20 creative attributes were identified using Random Forest and SHAP values interpretability capabilities

The biggest challenge to overcome in this study was the large number of binary predictors, with which models are likely to capture noise in the data, resulting in overfitting and poor generalization capabilities.

Machine learning models that limit the learning process (regularization) and/or can capture non-linear relationships were prioritized, such as ensemble Trees and Random Forest (cf. Figure 6)

Appendix 1: Random Forest Methodology

The benefits of using random forest and ensemble learning algorithms are as follows:

1. Handling of High-Dimensional Data

Each “weak” tree learner is trained on a random subset of features and data points, helping to reduce the impact of irrelevant or redundant features.

2. Robustness to Over-Fitting

Combining the predictions of multiple low bias trees reduces the variance of the ensemble model and ensures generalizability on unseen data.

3. Non-Linear Decision Boundaries

Random forest handles binary data as well as continuous variables and is well-suited to capture intricate/complex patterns in high noise data settings.

4. Less Sensitivity to Hyperparameters

Compared to other machine learning models, Random Forest requires less tuning and performs well with default parameters.

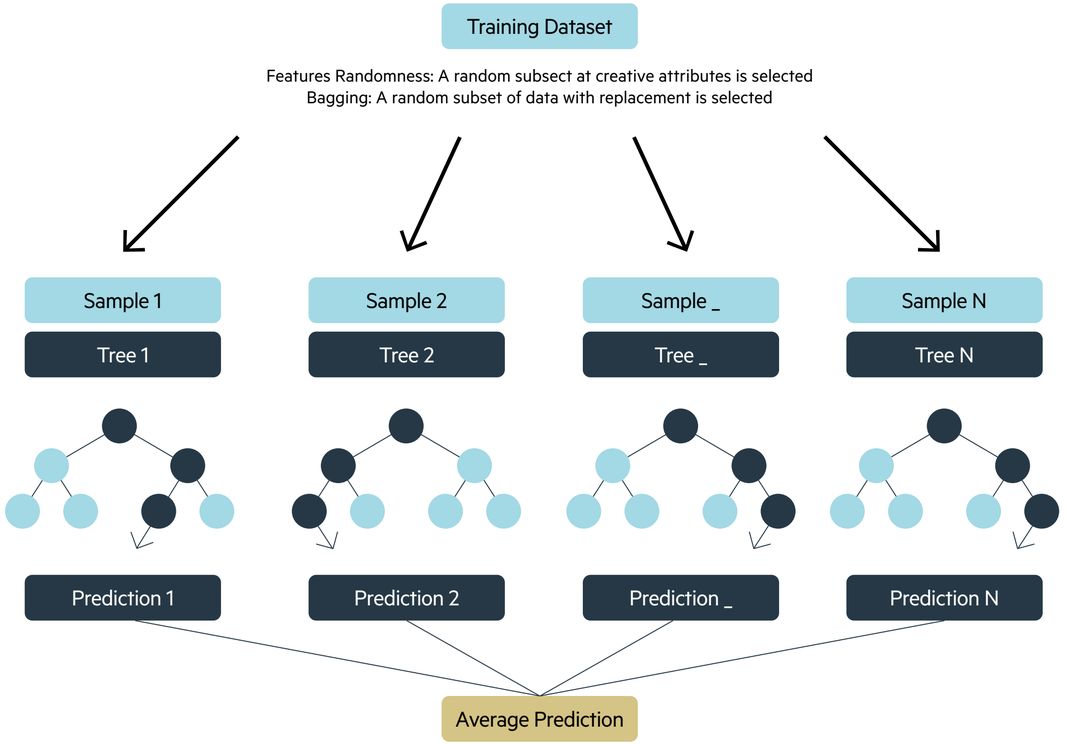


Figure 6: Random Forest Representation

Appendix 1: Random Forest Methodology

To understand which model best explained the relationship between the following creative best practices and video performance (ROI), we tested four different regression techniques: lasso, ridge, random forest and XG Boost.

By testing the latter algorithms, our objective was to achieve the optimal balance between low bias (i.e. the model captures underlying patterns in the study data) and low variance (i.e. the results are applicable to unseen data).

To do so, we used the K-Fold Cross Validation resampling method (with K=5) to randomly split the dataset into K-Folds, using K-1 folds for training and the remaining for assessing performance on unseen data.

To assess the final results, we used the Mean Squared Error (MSE) indicator. The lower the error metric value on unseen data, the better the model performs. Random Forest had the lowest MSE value averaged across the K-Folds (cf Figure 7: 0.09) and was thus selected for this study.

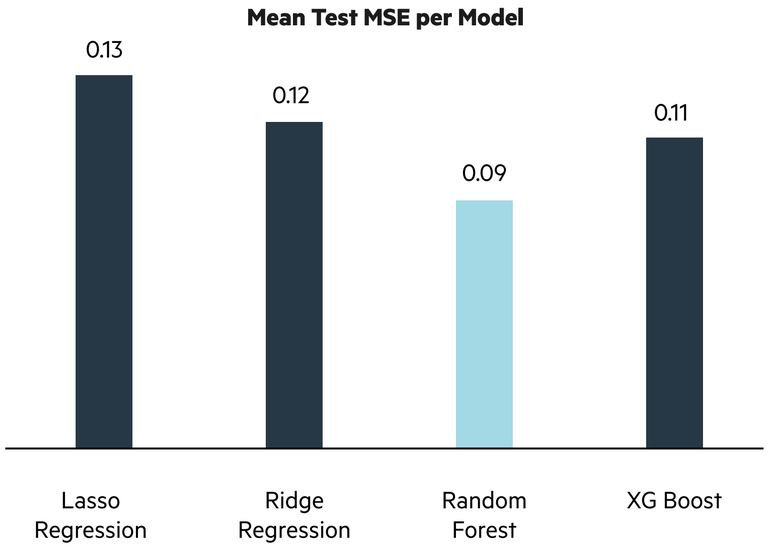


Figure 7 Results of Models Testing

Random forest hyperparameters were adjusted to optimize performance and results, then evaluated on a 10% data subset that had been left aside for validation purposes.

MAPE

The final mean average percentage error is 13%, signifying the model achieved good accuracy on smaller indexed ROI values.

R-Squared

The proportion of variance in ROIs predicted by the final model was 70%, indicating a substantial fit.

Once Random Forest was selected as our study methodology and fine-tuned, we extracted the creative best practices' importance in predicting ROI.

A common issue is that Random Forest performs well in our high noise setting but is a complex "black-box" model, difficult to interpret and not transparent.

To solve this issue, SHAP values were used to help explain why the model made a specific ROI prediction for a given video, making Random Forest explainable.

SHAP values are a method of quantifying the impact of each individual feature of a Random Forest, significantly increasing transparency and interpretability. The SHAP value of a creative attribute feature can be interpreted as "the impact on ROI of the attribute being present in a creative".

For each ROI prediction by our model, SHAP values allow us to break down how much each feature contributed to the ROI prediction. This allowed us to determine the most impactful attributes at an overall level.

An important note about SHAP values is that to accurately estimate the contribution of a feature, there needs to be enough examples of creatives with the feature and without the feature to isolate its impact. Thus, any attributes that are com mon across most videos have a lower differentiation impact on ROI.

Apendix 2:
Top 20 Creative Attributes Criteria for Creative Quality Compliance

Attention

Creative Rule	Meassured By:
Sound Effect	Features sound effects (e.g. revving engine, can opening, ‘crunch’, water splashing, door closing, fingers snapping, bottle opening). Excludes music.
Heartbeat Story Arc	Involves alternating between moments of tension and release throughout the narrative.
Large Supers	Any large supers (text overlays) have been incorporated into the video.
Supers (Audio See & Say)	The speech heard in the ad matches the text shown on screen in the same frame EXACTLY.
Supers (Audio Sugmenting)	The speech heard in the ad is contextually supportive of the overlaid text shown on screen.
Directo to Camera	The viewer is addressed directly via direct contact from a person shown on screen.
High Contrast Visuals	Uses stark differences in brightness, color, or texture to create visual impact and draw attention to specific elements within an image or design.

Branding

Creative Rule	Meassured By:
Jingle	Includes a jingle at any time and in any capacity
Product Mention (Speech)	The branded product name or generic product category features in the audio.

Connection

Creative Rule	Meassured By:
Product Context	The product and/or service is shown in the context a potential user would encounter it. This can be done through a product demo or other visual method of showing the product/service in use.
Delight	It attempts to engage the user with intriguing/mysterious (partial reveal), surprising, unique, unexpected (outside of expected context) or otherwise delightful imagery or language - spoken (audio) or in text.
Emotions	The ad attempts to arouse an emotional response through extreme emotions (i.e. fear, anger, joy, laughter, sadness, acceptance, disgust, anticipation, surprise). This can be done explicitly or implicitly through on-screen text or people or via audio with speech or music.
Character Driven	The story is driven by a single character (person, mascot etc.). Supporting characters can be present but a single character should standout as the lead.
Focused Messaging	A straightforward and understandable message is featured in the ad. That is to say, does the ad clearly state or show what the brand/product can do, who they are, or what the brand would like the viewer to do? If it offers multiple messages, a single message should emerge as clear and memorable.

Direction

Creative Rule	Meassured By:
Relevant Call to Action	A CTA is shown after a product, problem, need or insight appears.
Call to Action (Text)	A CTA phrase is detected at any time within the video's supers (overlaid text).
Path to Purchase	Visualizes (in overlaid text) or mentions (in speech) how/where the viewer can purchase or partake. This may refer to a physical store or other point of sale such as an App or Website.
Purchase Incentive (Limited Time/Quantities)	There are mentions of limited time or quantities in the creative. (Text and/or Speech). Excludes T&Cs or fine print.
Special Offer (Speech)	A special offer or discount is mentioned in speech.
Special Offer (Text)	Mentions of a special offer or discount in overlaid text. This does not include instances where the word is found in T&Cs or fine print.

About Ekimetrics

Ekimetrics is a leader in data science and AI-powered solutions. Since 2006, we've pioneered the use of AI and advanced data science applied to unified marketing measurement, holistic business optimization and broad-ranging sustainability goals.

Our goal
To combine high impact with long-term business purpose to redefine performance.

From data engineering to analytics, data culture to transformation, our holistic approach to marketing effectiveness has earned us significant recognition, including being named a 'Leader' in the most recent Forrester WaveTM: Marketing and Optimization Q3 2023, where we scored top for talent, with 5/5 on 16 different criteria, including Marketing Strategy Consulting and Global Client Management.

> **"Ekimetrics combines cutting-edge tools with bold vision and innovation... providing marketers with next-generation analytics... [and] strong engineering chops."**
>
> **Forrester**

Want to know more?
Drop us a line, we'd love to hear from you.

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