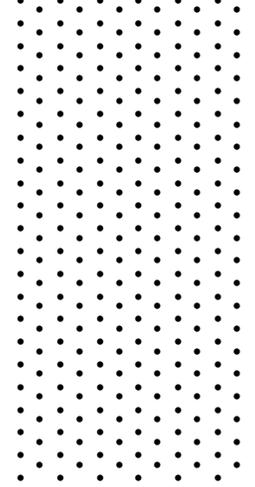
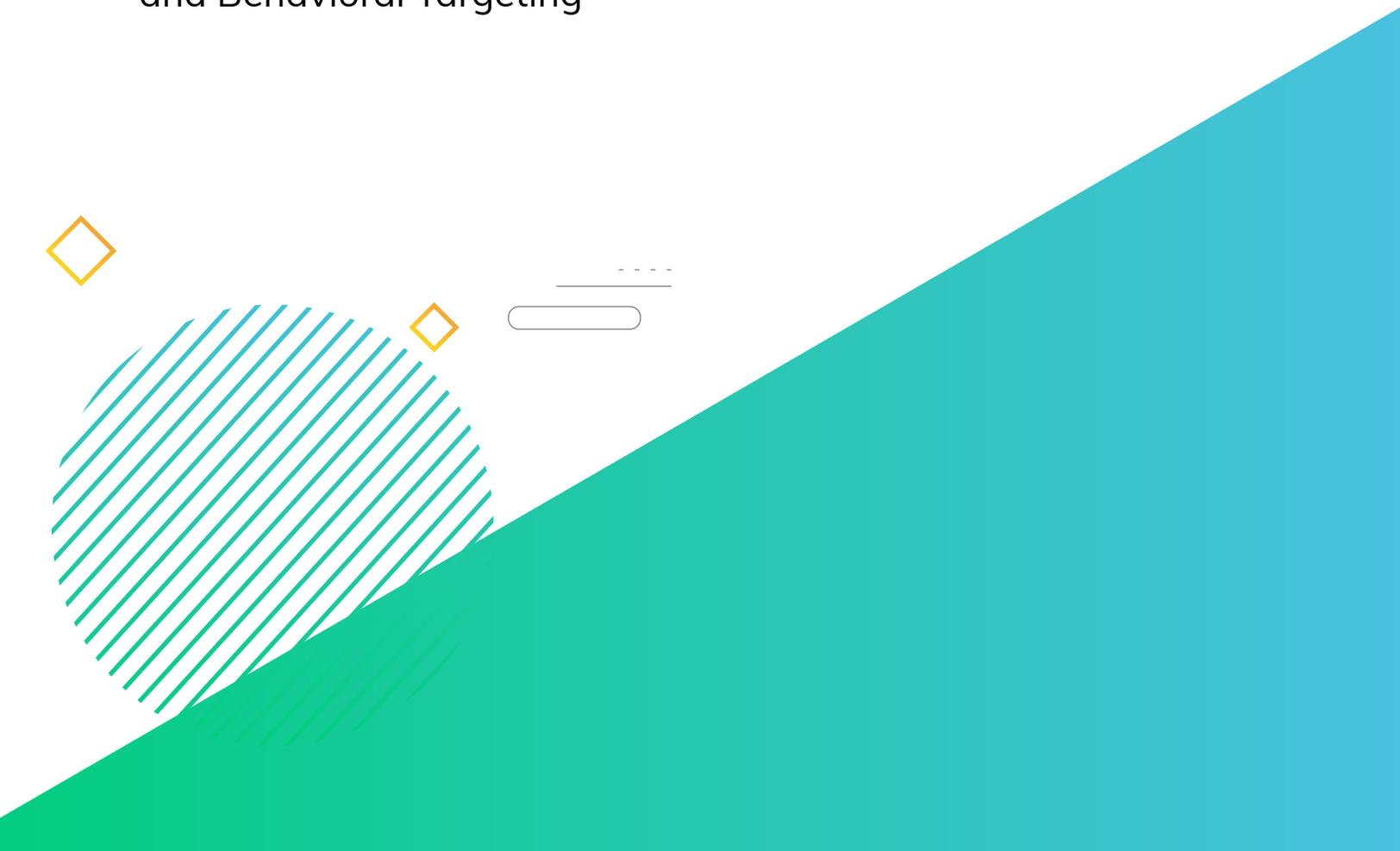


**dentsu**



# Understanding Contextual Relevance and Efficiency

A Comparison of Contextual Intelligence Vendors  
and Behavioral Targeting



## Introduction

Digital advertising has evolved over the past decade to rely on targeting users programmatically based on previous browsing activity. This common practice of purchasing specific audiences or behavioral segments relies on the web browser storing cookies for individual users. Given privacy-related regulation (e.g., GDPR and CCPA) which enable users to more easily opt out of cookies, and decisions from large players like Apple and Google to phase out third party cookies, advertisers are looking for different solutions.

Contextual Intelligence is another way of programmatically purchasing digital advertising based on appropriate categories of relevance. For example, a tech advertiser can choose to purchase advertising directly on CNET or the technology section of the New York Times by purchasing advertising from those sites directly at a high CPM. Alternatively, they can leverage Contextual Intelligence technologies to find technology related pages across thousands of websites at a much lower CPM.

In recent years, a number of companies have developed in the Contextual Intelligence space. Given the proliferation of Contextual Intelligence vendors, it is challenging for advertisers to gauge the effectiveness of each vendor without running a test campaign. We partnered with Dentsu Aegis Network to run a rigorous experimental design with four live campaigns in order to better understand the overall effectiveness of Contextual Intelligence targeting and to benchmark four of the top Contextual Intelligence vendors.

## Background

What is Contextual Intelligence?

Vendors are able to analyze the data on a given webpage to determine whether the content is relevant to a specific advertiser (e.g., technology content for a tech brand, makeup or beauty content for a beauty brand, etc). In addition to ensuring that the content on the page is relevant to the advertiser, these vendors also ensure that the content on the page is “brand safe” - ensuring that brands’ creative messages do not appear adjacent to inappropriate content. Relevant ads are served based on this real-time determination of the pages’ context.

## Behavioral Targeting

Behavioral targeting, on the other hand, leverages an individual's past online behavior, using cookies, to target across the web, regardless of content, safety or relevance. For example, if a user visits CNET to look at laptops, that same user could be served an ad for a laptop in a subsequent web surfing session even if she is on a baking site or reading her local news.

## Study Objectives:

The goal of this research was to examine and compare behavioral and contextual targeting methods in an effort to cost effectively reach target audiences in relevant, brand safe environments.

**Objective A:** Evaluate cost efficiency of Contextual Intelligence targeting vs. behavioral targeting

**Objective B:** Compare the accuracy of Contextual Intelligence vendors in placing ads within relevant content

## Methodology:

We partnered with Dentsu Aegis Network to test our hypotheses using live campaigns. Four of Dentsu's clients representing different industries participated in this test: A major technology company, Sephora, a big box retailer and a direct to consumer retailer. We ran live campaigns for each of these four advertisers in May 2020 across four Contextual Intelligence vendors, and we compared efficiency of contextual to behavioral targeting.

1 million impressions served for 2 weeks in May 2020, using the same eligible inventory



- Campaign Set-Up:** Each of the five campaigns (one behaviorally targeted campaign and four campaigns each targeted by four different Contextual Intelligence vendors) were set-up identically and were served 200K impressions each. The three other Contextual Intelligence vendors campaigns ran through Xandr Invest, and the behavioral targeting and GumGum Verity™ campaigns ran through GumGum's platform.
- Creative & Performance:** The same ad unit (728 x 90) was run across all ad lines, and no optimizations were conducted during the campaign.
- Cost:** Each of the four Contextual Intelligence vendors inventory was set to bid at a \$3 CPM, plus any additional data costs. Although GumGum Verity™ is not yet priced for external marketplaces, we added a data fee to keep the CPMs comparable across Contextual vendors. For the behavioral targeting ad line, the CPMs varied.
- Brand Safety:** The eligible inventory (across all vendors) was limited to what GumGum Verity™ deemed 'Safe' inventory. Again, the same pool of inventory was leveraged for all five ad lines.
- Oversight:** An independent research consultant and digital media pioneer (Dr. Michele Madansky) oversaw the design, implementation, reporting, and analysis.

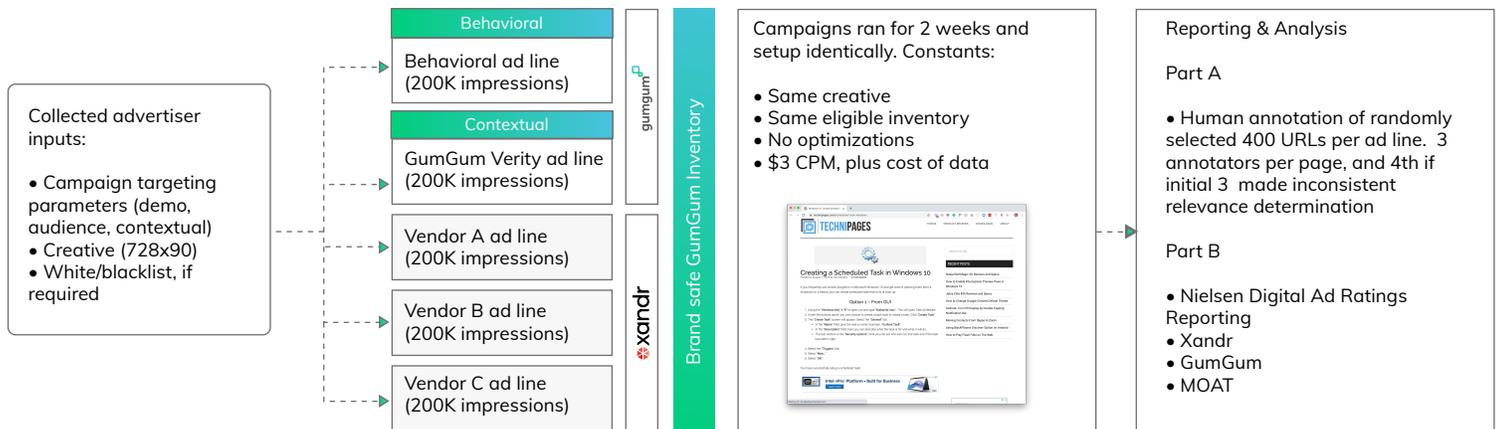
Campaign Metrics were captured using the following tools:

**Part A - Cost Efficiency:** Nielsen Digital Ad Ratings Reporting, Xandr's Buying Platform, Xandr Invest and GumGum, MOAT.

**Part B - Content Relevance:** Appen, a third party vendor specializing in human annotation of randomly selected URLs

# Visualizing the Approach for Each Campaign

1M impressions were served for 2 weeks in May 2020. A consultant, Dr. Michele Madansky, oversaw design, implementation, reporting, and analysis.



## Campaign Set-Up:

Each advertiser provided us with a description of their intended audience (e.g., IT Decision Makers in companies with 100+ employees). In addition, they provided us with contextually relevant categories for their campaign (e.g., computer networking, laptops, business IT). These were the parameters that we utilized to set up their campaigns through Xandr Invest or GumGum.

In addition, the advertisers provided us with typical demographic characteristics of their target audience (e.g., P25-54, M35+). This information was not used during the campaign for targeting, but was used after the campaign to help us understand how effective the technology was at reaching their desired demographics.

It is important to note that the specificity with which one can target contextually relevant content varies significantly across the Contextual Intelligence vendors. Two of the Contextual Intelligence vendors had only broad categories to choose from. In contrast, GumGum Verity™ and one of the other vendor had many more granular classifications within categories and aligned with the IAB 2.0 taxonomy.

As an example, when targeting technology content, GumGum Verity™ has nine categories to choose from, including: Technology & Computing, Business IT, Computer Networking, Desktops, Information and Network Security, Laptops, Operating Systems, Antivirus Software, PC Support. One of the other Contextual Intelligence vendors only has one option for the overall technology category.

#### Measuring Content Relevance:

We hired a third party human annotation company, Appen, to measure whether the content on which the ads were served was relevant to the category that had been pre-specified by the advertiser.

**Step 1)** Annotation company, Appen was sent n = 400 random urls from pages where ads ran from each Contextual Intelligence vendor as well as from the behavioral targeted ad line (n = 2,000 urls total/campaign). Note: confidence interval for results of +/- 1%.

**Step 2)** Human annotators were instructed to evaluate whether a page contained content that pertains to the appropriate category  
“Is this article related to any/all of these categories?”  
Computer Networking, Operating Systems, Desktops, Information and Network Security, Laptops, Business IT.

**Step 3)** Three humans evaluated each page to determine contextual relevance (yes, no).

If all three annotations were not the same, additional humans evaluated page until there was a consensus of 3 annotators. It's also worth pointing out that the annotation company did not know which vendors were represented by each tab of the spreadsheet.



**Output:** Each page was designated as contextually relevant (Yes) or not contextually relevant to the campaign (No). These data points were aggregated across each ad line and advertiser.

## Key Findings:

### Part A: Relative cost efficiency of behavioral targeting vs. contextual targeting

In order to evaluate the cost efficiency of Contextual Intelligence vendors and behavioral targeting, we looked at three different measures of efficiency. And while we recognize that each of these metrics may not be how advertisers evaluate their campaigns, these three metrics do allow us to fairly and accurately measure efficiency across Contextual Intelligence vendors and behavioral targeting.

**#1 - In-Demo eCPM:** Cost per thousand in-demo impressions

**#2 - CPC:** Cost per click

**#3 - vCPM:** Cost per thousand that were viewable under the MRC standard (50% of pixels in-view for at least 1 continuous second)

Cost Efficiency: Cost per In-demo Impression (eCPM)

Although we understand that demographic targeting may not be how many advertisers plan their campaigns, we did want to answer the question of whether the ads reached their intended targets. We did not use any demographic targets when setting up the contextual targeted and behaviorally targeted campaigns. However, in order to assess how well the campaigns mapped to the advertisers' primary demographic, we analyzed the percentage of in-demo impressions from Nielsen Digital Ad Ratings Reporting. This allowed us to assess whether the campaigns reached their intended audiences in a uniform way. Taking into account CPMs, **Contextual Intelligence Vendor impressions cost 29% less than behaviorally targeted impressions, and GumGum Verity™ impressions cost 36% less than behaviorally targeted impressions.**

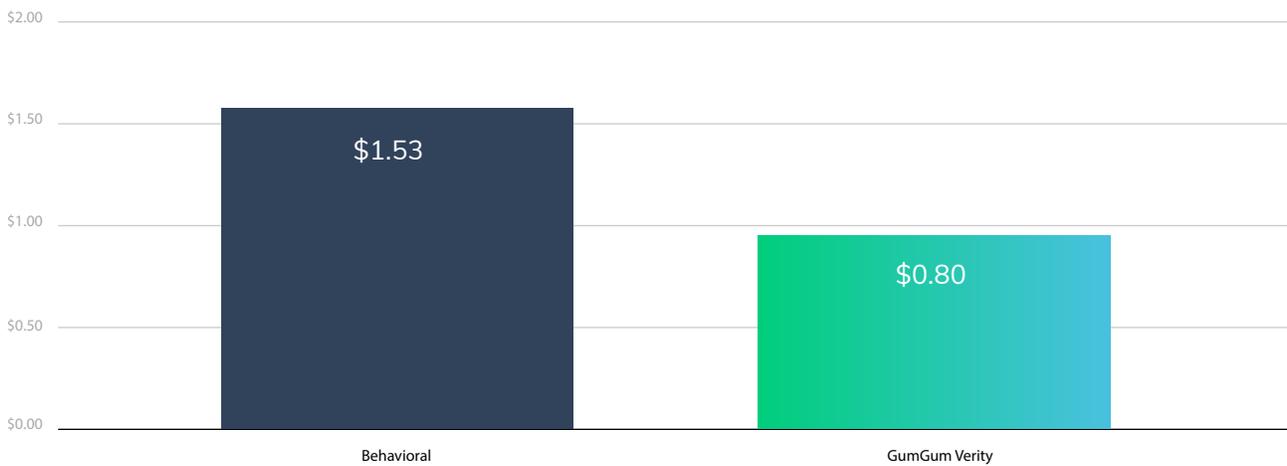
In-Demo eCPM (Aggregate)



### Cost Efficiency: Cost per Click (CPC)

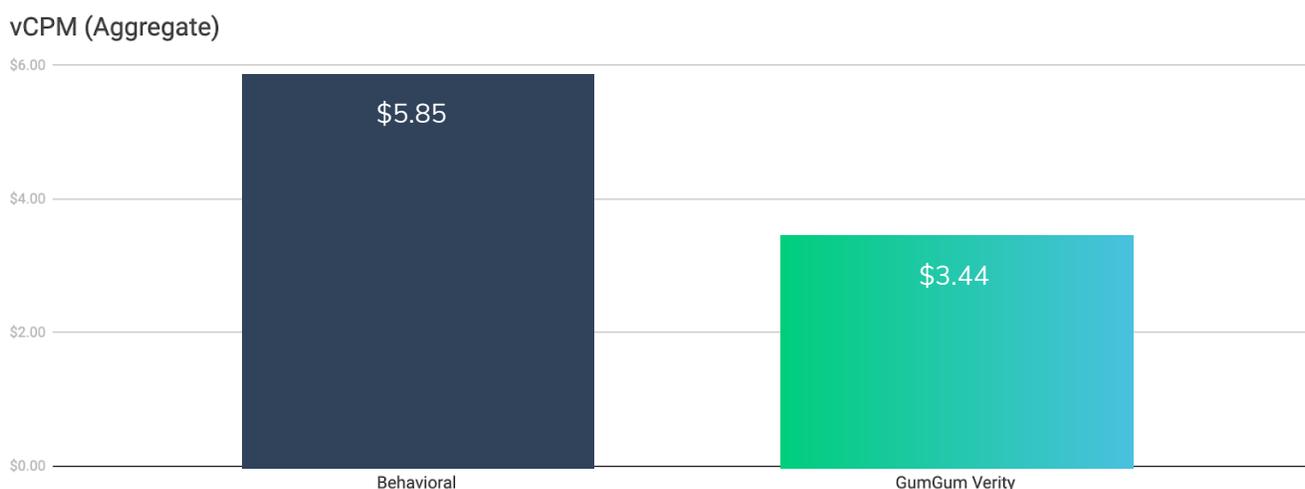
GumGum’s platform auto optimizes for clickthrough rates. Since the other contextual vendors’ impressions were not automatically optimized for CTR given study limitations, we only compared behavioral targeted ads (which ran through GumGum’s platform) to GumGum’s Verity™ Contextual Intelligence Platform. Even with the auto optimization in place, GumGum’s Verity™’s cost per click was 48% lower than behaviorally targeted ads.

CPC



## Cost Efficiency: Cost per Viewable Impression (vCPM)

The GumGum platform also auto optimizes for viewability. As a result, we are also comparing behaviorally targeted ads vs. GumGum Verity™ to represent contextual targeting. We analyzed the percentage of viewable impressions as defined by the MRC (50% of pixels in-view for at least 1 continuous second). After taking into account CPMs for each ad line, Verity™'s cost per viewable impression was 41% less than behaviorally targeted ads.



For all three metrics, eCPM, CPC and vCPM, Contextual targeting was more cost efficient than behaviorally targeted ads.

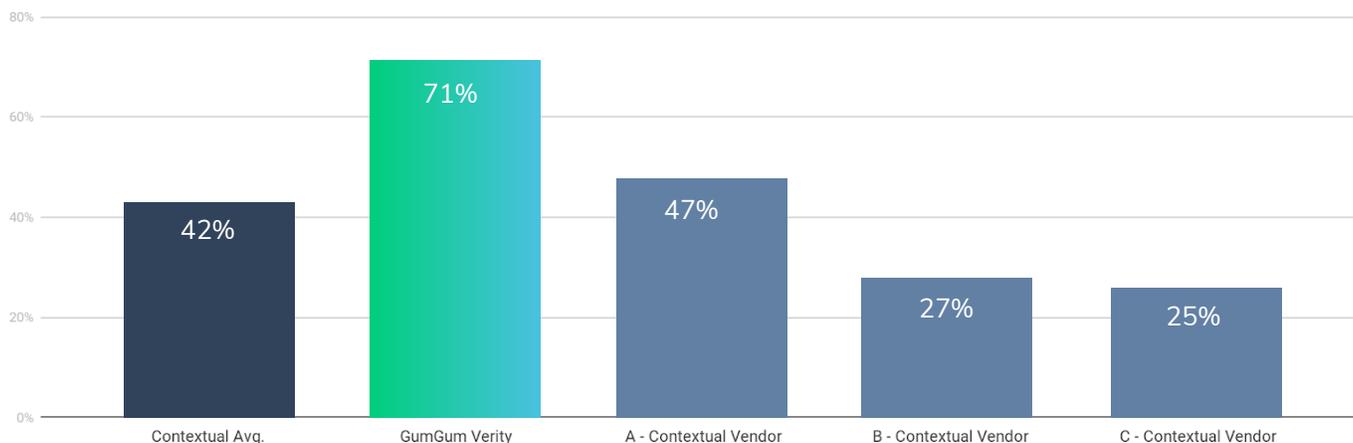
## Part B: Accuracy of Contextual Intelligence vendors

**Relevant Page Percentage:** The percentage of pages that are relevant to the contextual targeting goals of the campaign. Based on the methodology we described above using 3+ human annotators, we found that:

71% of pages GumGum Verity™ selected were relevant, outperforming Contextual Intelligence vendors overall by 1.7X.



Relevant Page Percent (Aggregate)



## Results Summary

### Part A

Contextual targeting was more efficient than behavioral targeting on average across campaigns when looking at three different measures for cost efficiency (CPC, vCPM and in-demo eCPM)

Higher CPMs for behaviorally targeted ads certainly factor into this increased efficiency, but we also hypothesize that increased relevance also improves campaign engagement.

### Part B

GumGum Verity™ had the highest percentage of relevant pages across all four Contextual Intelligence vendors.

## About GumGum Verity™:

GumGum Verity™'s performance is fueled by a decade of collecting labeled data, training and refining our algorithms.

**Advanced Machine Learning:** Verity™'s Machine learning allows computers to understand a web page like a human would. Reading between the lines, Verity™ comprehends the holistic and subtle meaning of all text and imagery in an article. Verity™ continuously improves with more training data, making predictions and decisions without being explicitly programmed to do so. Some other Contextual Intelligence vendors rely exclusively on keywords. This technology does not allow the algorithms to adapt as well as machine learning.

**Full-Page Analysis using Computer Vision + Natural Language Processing:** GumGum Verity™ utilizes computer vision to understand images and natural language processing to understand text, both leveraging deep neural networks trained on its proprietary data sets. Combining GumGum's decade of experience in computer vision, with the best NLP, no other vendor can match the accuracy of Verity™.

## About GumGum

GumGum is a global technology and media company specializing in Contextual Intelligence. For over a decade, GumGum has applied proven machine learning expertise to extract value from digital content for the advertising and sports industries. For advertisers, GumGum offers a full suite of pioneering future-proof solutions. The company's contextual advertising engine, Verity™, comprehends the meaning of text, images and video online, allowing marketers to safely and precisely place ads where people are most engaged. Combining contextual targeting and brand safety intelligence with proprietary high-impact ad formats, GumGum's advertising solutions deliver industry leading efficiency, accuracy and performance.

For more information, contact: [contextualadvertising@gumgum.com](mailto:contextualadvertising@gumgum.com)

# About Dentsu Aegis Network

Part of Dentsu Inc., Dentsu Aegis Network is made up of ten global network brands - Carat, Dentsu, dentsu X, iProspect, Isobar, dentsumcgarrybowen, Merkle, MKTG, Posterscope and Vizeum and supported by its specialist/multi-market brands. Dentsu Aegis Network is innovating the way brands are built for its clients through its best-in-class expertise and capabilities in media, digital and creative communications services.

Offering a distinctive and innovative range of products and services, Dentsu Aegis Network is headquartered in London and operates in 145 countries worldwide with more than 40,000 dedicated specialists.

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