Publicis Cognitive Marketing
Intelligence Platform
The proliferation of data fueled by our digitally connected economy is forcing brands to fundamentally redefine the way in which they interact with their consumers by taking a customer-obsessed approach to transforming their business. Being able to harness intelligence from online and offline data to a single view of the customer, and act on it at the right time and through the right channel, is what will separate great brands from the rest.

With consumers increasingly becoming cross-channel and open to highly personalized experiences, marketers are turning to artificial intelligence and machine learning to increase brand sophistication. With oceans of data being produced by digital channels, smart sensors and connected devices, there has never been a better time for marketers to capitalize on the rise of algorithms and cognitive automation to generate competitive intelligence and drive deeper customer engagement.

To help clients stay ahead of this rapidly evolving digital economy with the increasingly ubiquitous nature of mobile among consumers, we created COSMOS™, a cognitive data intelligence platform built for marketers to provide deeper customer engagement. Powered by patents pending artificial intelligence, COSMOS™ solves the challenge of fragmented audiences, disparate customer data sources and siloed experiences within your brand. COSMOS™ learns, reasons and activates the ultimate engagement with deeper customer insights, reducing the anxiety of choice and introducing cognitive optimizations that drive loyalty, improve customer retention and give experiences a never-before-seen level of personalization.

Samih Fadli, Global Chief Intelligence Officer
Publicis.Sapient
samih.fadli@razorfish.com
Contents

01. The Age of Cognitive Experiences ........................................ 02
   The age of consumer empowerment.
   How well do you know your customers?
   The rewards of data-driven experiences are significant.
   Data paralysis is still an issue for many marketers.
   Intelligent marketing addresses the problem.
   People are more loyal to their need in the moment
   than to any particular brand.
   Brand-personalized cross-screen experiences
   require customer trust.

02. COSMOS™ Platform ..................................................... 10

03. COSMOS™ Cognitive Cloud ........................................... 14
   COSMOS™ Cognitive Vision
   COSMOS™ Cognitive Speech
   COSMOS™ Cognitive Language Services
   COSMOS™ Knowledge APIs
   COSMOS™ Search APIs

04. COSMOS™ Platform Architecture ................................... 26
   COSMOS™ activates intelligence.
   Intelligence-as-a-Service
   Data sources
   Universal ID matching across devices and channels
   Timely, relevant and frictionless brand experiences

05. Legal ............................................................................ 34

06. Contact Us ...................................................................... 36
01. The Age of Cognitive Experiences
The age of consumer empowerment.

We are in the age of consumer empowerment, when customers expect brands to be connected and relevant and to meet their needs at every interaction. To meet this expectation, leading marketers are taking a customer-obsessed approach to transforming their businesses by investing in the data, talent, tools and strategies needed to respond to the needs of the connected consumer.

Today, many brands struggle to keep pace with the volume, velocity and variety of data in order to meet customer expectations. According to Gartner, Inc., 90 percent of the world’s data has been created during the past two years. This growth and availability of data has led to an expectation of data usage to enable relevant, personalized experiences. It is not enough to collect and structure the data; it must be acted upon. Consumers expect timely, relevant and seamless brand experiences. Therefore, brands must anticipate and predict their customers’ needs, habits, trends, sentiments and preferences to engage their customers in one-on-one conversations at the right moment of decision making.

As the connected economy marches forward at an accelerating pace, data is proving to be marketing’s most valuable currency. Oceans of data generated from the Internet of Things (IoT) will magnify both the problem and the opportunity. But additional data lacks value if it can’t be reduced to that magical piece of insight that informs unique, differentiated experiences that only your brand can deliver.

A machine learning and intelligence platform provides a way forward, one that takes full advantage of technology breakthroughs in machine learning algorithms, deep learning networks and artificial intelligence (AI).

How well do you know your customers?

It’s a critical question that demands an even more critical answer. In today’s digital economy, with so much happening online and offline, customers increasingly expect an experience that filters out non-relevant information. According to research from Teradata, 85 percent of customers are fully aware that brands track their behavior in an effort to be more relevant. Research also reveals that 70 percent of buyers are amenable to exchanging personal data to get a more relevant experience.
The rewards of data-driven experiences are significant.

The rewards for delivering a data-driven experience, drawn not just from information but from deep insights and intelligence, can be significant in terms of greater conversions and loyalty. According to Gartner, Inc., a relevant offer during a spontaneous customer interaction can result in 15x improvement in customer response rates. Moreover, 76 percent of customers say they are willing to pay 5 percent more for a product or service that delivers a superior experience.

Data paralysis is still an issue for many marketers.

While the opportunities are vast, digital marketing is about to get even more challenging as the volume, variety and velocity of data generated from a connected economy explode. The amount of stored information grows four times faster than the world economy, while cloud computing power grows nine times faster. It’s little wonder that marketers struggle with information overload—which ironically reduces them to data paralysis, where the benefits from data are never fully realized. In part, this scenario stems from a lack of the right mix of algorithms and technology for translating big data into actionable intelligence.

Intelligent marketing addresses the problem.

Recent breakthroughs in technology are starting to shift the conversation from data-driven marketing to intelligent marketing, where everyday decisions are informed by potentially billions of data points, rather than guesses and assumptions.

Huge new sources of structured, semi-structured and unstructured data are available to ingest, analyze and compare. With accessible and diverse data and the power to comb through it, data scientists can understand complex phenomena we’ve never had access to in the past. Machine learning algorithms can provide statistical evidence that something might be wrong or right based on how many past occurrences of similar patterns exist.

People are more loyal to their need in the moment than to any particular brand.

The stakes have never been higher to adopt a micro-moments mindset and employ these strategies. As customers consume content, interact with each other and engage in multiple, simultaneous conversations, marketers have the challenge of determining the optimal moment to engage. During
these optimal opportunities, known as micro-moments, the customer decides to either continue or abandon a relationship with the brand. Such micro-moments are real-time, intent-driven events that are critical opportunities for brands to shape customer decisions and preferences.

Using intelligence derived from data, brands can map the entire customer journey across devices and channels using COSMOS™ to predict how the consumer wants to interact with the brand and personalize each moment for the consumer. As the volume of data grows, COSMOS™ extracts intelligence to provide the insights that marketers need to deliver incredible experiences.

Micro-moments are the new battleground for brands. Here are three essential strategies that can help you win micro-moments:

• **Be there.** Anticipate the micro-moments for your customers, and then be ready to help when those moments occur.

• **Be relevant.** Be relevant to consumers’ needs in the moment, and connect people to the content they’re looking for.

• **Be timely.** They’re called micro-moments for a reason. Connected device users want to know, go and buy swiftly. Your cross-channel experience has to be fast and frictionless.

“Seventy-six percent of customers say they are willing to pay 5 percent more for a product or service that delivers a superior experience.”

—Gartner, Inc.
To help you get started building your own micro-moments strategy, we’ve got everything you need to know to be there, be relevant and be timely—and then to rethink your measurement and organizational strategies to know how to connect the dots.

**Brand-personalized cross-screen experiences require customer trust.**

The ways that consumers interact with your brand are changing, and if you aren’t factoring the proliferation of data and mobile devices into your personalization strategy, the odds of your brand keeping up with the competition are very low. Today, consumers expect to navigate seamlessly between their connected devices. If your brand’s digital experience is inconsistent and irrelevant, your customers are more likely to embrace more relevant brands.

What marketers often term “personalization” is actually personification, meaning that the brand experience, search and targeting are based on limited and deterministic information (e.g., first- and second-party data). While such experiences depart from mass marketing, personification delivers relevant digital experiences to individuals based on their inferred membership in a defined customer segment. Such experiences do not always reflect behavior unique to that individual; rather, they treat the individual as a member of the marketer’s mass segment.
True personalization is achieved with three fundamental elements: accurate data, consumer transparency and permission. Obviously, data is key to achieving relevancy and immediacy. However, delivering a true personalized brand relationship takes time, and that time has to be spent building trust with consumers. Gaining permission to advance the relationship is also critical to success because consumers are in control. Once brands earn trust, consumers are more likely to share more unique and specific data, leading to deep insight into their unique behaviors, habits, preferences, sentiments and the ability to identify micro-moments across every step of the customer journey.

COSMOS™ uses patent-pending algorithms and deterministic and probabilistic customer data, including behavior that occurs outside the brand’s owned and controlled marketing activities. This includes, but is not limited to:

- Cookie IDs, device IDs, panel IDs
- Demographic information
- Search, click, website and app activity
- Consumer response to marketing communications
- Response to lead nurturing campaigns and advertising
- Social behavior
- Data acquired from third parties
Safeguarding privacy is the cornerstone of trust—and COSMOS™ provides multiple options for consumers to control their participation at different points of the experience.

The realization of a truly personalized experience is made possible through several COSMOS™ patent-pending algorithms that help marketers safeguard privacy and provide a deeper personalized brand experience by using cross-device predictive, prescriptive and descriptive machine learning models.

To win the hearts and minds of consumers at the right moment when they want to know something, go somewhere, do something and buy something, marketers need to do more than just show up. They need to be useful and meet customers’ needs in those moments. This means connecting people to what they’re looking for in real time and providing relevant information when they need it across all channels and devices.
“The insights and opportunities on offer to the creative process through the appliance of data science, the inclusion of AI and the deployment of algorithms are truly liberating. We now have the ability to create and think and build experiences that will not only disrupt and bring progress to brands and businesses, but improve the lives of their customers like never before.”

Daniel Bonner, Chief Creative Officer
02.

COSMOS™ Platform

“COSMOS™ enables our clients to harness the awesome power of Microsoft’s machine learning and artificial intelligence technologies to produce industry-driven cognitive experiences for their customers. Our teams bring the industry and creative intelligences and insights to make their solutions relevant.”

Ray Velez
Global CTO,
SapientRazorfish
Consumer 360 Graph

Overview:
COSMOS™ Consumer 360 is a cloud-based marketing solution that harnesses intelligence from online and offline data to create a single view of the customer.

What It Does:
- Normalizes fragmented first-party customer data sources organized by channel, product, department or P&L into one customer data profile.

Benefits:
- Deeper customer insights
- Enables true one-to-one personalization
- Lift and conversion optimization
- Single view of the customer
Audience Intelligence

Overview:
COSMOS™ audience intelligence will provide Media Planners with unique audience segmentation capabilities to drive better marketing decisions and pinpoint the exact consumers you should target with a personalized brand message.

What It Does:
• Use machine learning to analyze the behavioral attributes appended to a user’s profile to determine which attributes are most likely to predict a user’s actions.
• Find look-alike and act-alike audiences that will likely take action on your campaigns in order to improve your marketing KPIs.
• Target people likely to be interested in your product and reach people based on offline actions, such as being a homeowner, likely buyer, etc.

Benefits:
• Drive more lift with one-to-one audience targeting.
• Drive demand and customer acquisition.
• Estimate customer lifetime value and help prevent churn.

Cognitive Automation

Overview:
COSMOS™ cognitive automation powers your campaigns with intelligence decisions and prescriptions, from analyzing images and video to gaining insights from text.

What It Does:
• COSMOS™ cognitive services let you build apps with powerful algorithms using just a few lines of code.
• Train cognitive marketing algorithms using a high-performance, deep learning network toolkit to enable automatic speech recognition, image recognition and captioning, text processing and relevance, language understanding and modeling, and more.

Benefits:
• Leverage models pre-built with extensive training.
• Enable rich and relevant customer experience and engagements.
Marketing Analytics

Overview:
COSMOS™ Marketing Analytics provides holistic visualization and insights on marketing intelligence. It also adds predictive insights and recommendations to improve performance.

What It Does:
• Visualizes data of marketing programs in live dashboards in the brand’s preferred BI tool.
• Gives brands a single source to review marketing performance for all their marketing tactics and visualize multi-channel attribution.
• Provides the ability to predict impacts of marketing strategy changes or external impacts such as weather or economy fluctuations.

Benefits:
• Predict impacts of changes in strategy before implementation
• Test multiple program optimization to determine which one has the best chance for success.
• Understand the overall impact of all consumer touchpoints.
“Cognitive technologies are transforming nearly every industry on the planet. COSMOS™ provides a suite of production-ready tools that businesses can use to transform themselves and generate competitive advantages in their markets.

Tomorrow’s market leaders will be those that operate with an AI-first mentality. COSMOS™ enables companies to accelerate their adoption of cognitive technologies and quickly generate real business benefits.”

Josh Sutton
Global Head, Data & Artificial Intelligence, Publicis.Sapient
The Cognitive Cloud

The COSMOS™ Cognitive Experiences Marketplace hosts powerful APIs that enable brands to create experiences using the most advanced technology currently available. The Cognitive Services APIs access pre-trained machine learning models for computer vision, speech recognition and natural language processing, allowing you to build your data product or personalized user experience faster, using our technology to get a head start.

COSMOS™ Cognitive Vision

From faces to feelings, allow your apps to understand images and videos.

Cognitive Vision API

Extract rich information from images to categorize and process visual data—and protect your users from unwanted content.

- **Analyze an image**: Get information about visual content found in an image. Use tagging, descriptions and domain-specific models to identify content and label it with confidence. Apply the adult/racy settings to enable automated restriction of adult content. Identify image types and color schemes in pictures.

- **Recognize celebrities**: Recognize 200,000 celebrities from business, politics, sports and entertainment around the world.

- **Analyze video in near real time**: Use any of the cognitive vision APIs with your video files by extracting frames of the video from your device and then sending those frames to the API calls of your choice. Get results from your videos faster.

- **Read text in images**: Optical character recognition (OCR) detects text in an image and extracts the recognized words into a machine-readable character stream. Analyze images to detect embedded text, generate character streams and enable searching. Allow users to take photos of text instead of copying to save time and effort.

- **Generate a thumbnail**: Generate a high-quality, storage-efficient thumbnail based on any input image. Use thumbnail generation to modify images to best suit your needs for size, shape and style. Apply smart cropping to generate thumbnails that differ from the aspect ratio of your original image, yet preserve the region of interest.
Content Moderator API
Automatically moderate text, images, and videos, augmented with human review tools for more nuanced cases.

• **Image moderation:** Automatically evaluate images for offensive and unwanted content across differing file types—including altered images. Content moderator includes optical character recognition (OCR) and face detection to improve the chances of detecting unwanted or exploitive content and implements fuzzy matching against your custom lists.

• **Text moderation:** Detect profanity in more than 100 languages and match text against your custom lists automatically. Content moderator also checks for malware and phishing URLs plus personally identifiable information (PII).

• **Video moderation:** Enable the proactive detection of adult content in videos with moderation handled in the cloud by Azure Media Services.

• **The review tool:** Enjoy the freedom and control of human oversight while still benefiting from automated moderation. Review tools let you review automated results with your team and approve or change tags to override the automated results. Thanks to machine learning and custom lists, your moderation process gets smarter the more you use it.

Facial Recognition API
Detect human faces and compare similar ones, organize people into groups according to visual similarity, and identify previously tagged people in images.

• **Face detection:** Get coordinates of faces within the image, along with face attributes that contain machine learning-based predictions of facial features. After detecting faces, you can pass the coordinates to the emotion API to speed up processing. Available face attributes are: age, gender, pose, smile, and facial hair along with 27 landmarks for each face in the image.

• **Face verification:** Check the likelihood that two faces belong to the same person. The API will return a confidence score about how likely it is that the faces match.

• **Face identification:** Search and identify faces. Tag people and groups with user-provided data and then search those for a match with previously unseen faces.
• **Similar face searching:** Easily find similar-looking faces. Given a collection of faces and a new face as a query, this API will return a collection of similar faces.

• **Face grouping:** Organize many unidentified faces together into groups, based on their visual similarity.

**Emotion Detection API**

Analyze faces to detect a range of feelings and personalize your app’s responses.

• **Recognize emotions in images:** Take a facial expression in an image as an input, and return the confidence across a set of emotions for each face in the image, as well as the bounding box for the face, using the face API. A user who has already called the face API can submit the face rectangle as an optional input. The emotions detected are anger, contempt, disgust, fear, happiness, neutral, sadness, and surprise. These emotions are understood to be cross-culturally and universally communicated with particular facial expressions.

• **Recognize emotions in video:** Recognizes the facial expressions of people in a video and returns a summary of their emotions. You can use this API to track how a person or a crowd responds to your content over time. The emotions detected are anger, contempt, disgust, fear, happiness, neutral, sadness, and surprise. Recognize emotions in near real time by extracting frames of a video and then sending those frames to the API calls of your choice.

**Video Intelligent Behaviors API**

Intelligent video processing produces stable video output, detects motion, creates intelligent thumbnails, and detects and tracks faces.

• **Stabilize shaky videos:** Automatically smooth and stabilize shaky videos.

• **Detect and track faces:** Analyze videos with high-precision face location detection and tracking to detect up to 64 human faces in a video.

• **Detect motion:** Detect when motion has occurred in videos with stationary backgrounds. This service will analyze a video, return metadata for frames in which motion is detected, and define the exact coordinates where motion occurred. Choose from between three sensitivity levels—low, medium, and high—to control the granularity of motion you want detected and merge thresholds to combine multiple motion events into one.
• **Generate video thumbnails:** Automatically create a motion thumbnail summary to let people quickly preview your video. The most representative scenes from the original video are selected to create a high-quality thumbnail.

• **Analyze in near real-time:** You can use the face, emotion, and computer vision APIs with your video file or live-stream today by extracting frames of the video from your device and then sending those frames to the API calls of your choice. Get results from your videos faster.

---

**COSMOS™ Speech**

Hear and speak to your users by filtering noise, identifying speakers and understanding intent.

**COSMOS™ Speech API**

Identify individual speakers or use speech as a means of authentication with the speaker authentication API.

• **Speaker verification:** Power applications with an intelligent verification tool. If the speaker claims a certain identity, use voice to verify this claim.

• **Speaker identification:** Determine the identity of an unknown speaker. Input audio of the unknown speaker is paired against a group of selected speakers, and if a match is found, the speaker’s identity is returned.
Custom Recognition API

Overcome speech recognition barriers like speaking style, background noise, and vocabulary.

- **Create custom language models:** Customize the language model of the speech recognizer by tailoring it to the vocabulary of the application and the speaking style of your users.
- **Create custom acoustic models:** Customize the acoustic model of the speech recognizer to better match the expected environment and user population of your application.
- Deploy your models to create a speech recognition endpoint that’s customized to your application.
- Send requests to your custom endpoint using RESTful API or the cognitive services speech client library.

Speaker Recognition API

Overcome speech recognition barriers like speaking style, background noise, and vocabulary.

- **Create custom language models:** Customize the language model of the speech recognizer by tailoring it to the vocabulary of the application and the speaking style of your users.

COSMOS™ Speech Analysis API

Convert audio to text, understand intent, and convert text back to speech for natural responsiveness.

- **Speech recognition:** Recognize audio coming from a microphone in real time, recognize audio coming from different real-time audio sources, or recognize audio from within a file.
- **Test to speech:** Build voice-triggered smart apps. When applications need to “talk” back to their users, this API will convert app-generated text into user targeted audio.
**COSMOS™ Cognitive Language Services**

Process text and learn how to recognize what users want.

**COSMOS™ Natural Language Understanding API**

Understand language contextually, so your app communicates with people in the way they speak.

- Language-understanding intelligent service is designed to provide you with an easy way to create models, which allow your applications to understand user commands.

**COSMOS™ Text Analytics API**

Detect sentiment, key phrases, topics, and language from your text.

- **Sentiment analysis**: return a numeric score between 0 and 1. Scores close to 1 indicate positive sentiment and scores close to 0 indicate negative sentiment. Sentiment score is generated using classification techniques. The input features of the classifier include n-grams, features generated from part-of-speech tags, and word embeddings.

- **Key phrase extraction**: return a list of strings denoting the key talking points in the input text. We employ techniques from Microsoft Office’s sophisticated natural language processing toolkit. English, French, Spanish and Portuguese text is supported.

- **Topic detection**: Return the detected topics for a list of submitted text records. A topic is identified with a key phrase, which can be one or more related words. This API requires a minimum of 100 text records to be submitted, but is designed to detect topics across hundreds to thousands of records.

- **Language detection**: Return the detected language and a numeric score between 0 and 1. Scores close to 1 indicate 100 percent certainty that the identified language is true. A total of 120 languages are supported.

**Cognitive Linguistic API**

Simplify complex language concepts and parse text with the linguistic analysis API.
Use advanced linguistic analysis tools for natural language processing, giving you access to part-of-speech tagging and parsing. These tools allow you to home in on important concepts and actions. The API can tap into traditional linguistic analysis tools that allow you to identify the concepts and actions in your text with part-of-speech tagging, and find phrases and concepts using natural language parsers. Whether you’re mining customer feedback, interpreting user commands, or consuming web text, understanding the structure of the text is a critical first step.

Given a body of text, one of the first steps in analysis is to break it into sentences and tokens.

Once your text is split into tokens, you can find the nouns (entities, persons, places, things, etc.), verbs (actions, changes of state), and more using part-of-speech tagging.

Determine the internal structure and meaning of a sentence (entities, purpose, etc.) by breaking it into labeled phrases. This helps you understand who is doing what to whom.

Translator API

Translate speech and text with a simple REST API call.

Language detection: The translator text API automatically detects the language of the text provided before translating and returning it. The API may also be called to return a detected language rather than a full translation.

Translation: For any of the nine supported spoken languages, and any of the 60 supported languages in text, the translation API allows translation to be added to your application. The translation API allows for easy localization of your app’s content with clear translations.

Custom translation system: Build a custom translation system, using a dictionary of company-specific words, or starting with as few as 1,000 parallel sentences.

Collaborative translation framework (CTF): Improve localized content through group-mediated suggestions for better and more accurate translations. These updated translations can then be used for the company’s specific hub to further improve its custom translation system.
COSMOS™ Knowledge APIs

Academic Knowledge API

Tap into the wealth of academic content in the Microsoft Academic Graph using the academic knowledge API.

- **Interpret**: Interprets a natural-language user query string. Returns annotated interpretations to enable rich search-box auto-completion experiences that anticipate what the user is typing.
- **Evaluate**: Evaluates a query expression and returns academic knowledge entity results.
- **Calchistogram**: Calculates a histogram of the distribution of attribute values for the academic entities returned by a query expression, such as the distribution of citations by year for a given author.
- **Similarity**: Calculates the academic cosine similarity between two text inputs. Assesses the similarity of not only words but concepts of the related texts.
- **Graph search**: Searches for a given graph pattern and returns the matched entity results. Graph patterns can be specified by JSON objects or lambda expressions.

Entity Linking Intelligence Service

Power your app’s data links with named entity recognition and disambiguation.

- **Entity linking**: Sometimes in different contexts, a word might be used as a named entity, a verb, or another word form within a given sentence. For example, in the case where “times” is a named entity, it still may refer to two separately distinguishable entities, such as “The New York Times” or “Times Square.” Given a specific paragraph of text within a document, the entity linking intelligence service will recognize and identify each separate entity based on the context.

Knowledge Exploration Service

Enable interactive search experiences over structured data via natural language inputs.

- **Natural language understanding**: To interpret natural language queries as structured query expressions.
- **Query auto-completion**: To reduce user effort and help with discovery of rich capabilities.
- **Structured query evaluation**: To efficiently retrieve detailed information about matching objects.
• **Attribute histograms:** To enable rich visualizations and interactive faceted experiences.

**QnA Maker**

Distill information into conversational, easy-to-navigate answers.

• Create a FAQ service from existing content. FAQ URLs can be easily converted to a knowledge base to answer questions about that content.

**Recommendations API**

Provide personalized product recommendations for your customer and improve sales in your store.

• **Frequently bought together (FBT) recommendations:** Learn from your previous transactions. When a customer visits a particular item, the recommendations engine suggests additional items that are likely to be purchased together in the same transaction.

• **Item-to-item recommendations:** This is the "Customers who liked this product also liked these other products" scenario. Increase the discoverability of items in your catalog by showing relevant products to your customers.

• **Personalized user recommendations:** Using a customer’s prior activity, personalize their experience by recommending items that they might be interested in. For example, using a customer’s viewing history for movies, it’s possible to recommend additional movies and shows of interest.
COSMOS™ Search APIs

Autosuggest API
Empower users to type less and do more with automated suggestions to complete their searches.

- Help users complete queries faster by adding intelligent type-ahead capabilities to your app or website.

Image Search API
Add a variety of image search options to your app or website, from trending images to detailed insights.

- Search for images and get comprehensive results: Scour the web for images. Results include thumbnails, full image URLs, publishing website info, image metadata, and more.

News Search API
Turn any app or website into a news desk with world news grouped and filtered by topic, local news, and searchable metadata.

- Search for news and get comprehensive results: Search the web for news articles. Results include details like an authoritative image of the news article, related news and categories, provider info, article URL, and date added.

Video Search API
Add a variety of advanced video search features to your app or website, including video previews, trending videos, and other useful metadata.

- Search for videos and get comprehensive results: Find videos across the web. Results provide useful metadata, including creator, encoding format, video length, view count and more. Try out the demo. Submit a query via the search box or click on one of the provided examples.
Web Search API

Bring intelligent search to your apps and harness the ability to comb through billions of web pages, images, videos and news articles with a single API call.

- Get enhanced search details from billions of web documents: Retrieve web documents indexed by Bing and narrow down the results by result type, freshness and more.
04. COSMOS™ Platform Architecture

“Most organizations now understand that becoming more data-driven is critical to their success. Traditionally, that meant using data analysis and insights to inform business decisions. Today, unlocking the full value of your data requires building direct connections between data and customer experiences. COSMOS leverages your data and customer intelligence to directly shape and optimize content, targeting, recommendations and customer service.”

Kyle Ploessl, VP, Data Science, Publicis.Sapient
COSMOS™ is a new generation of cognitive marketing intelligent platform powered by AI/ML algorithms that learn instantly from online and offline, structured and unstructured information—as consumers interact with the brand. At the same time, COSMOS™ reasons, predicts and anticipates the customer journey. Drawing on real-time interests, habits and emotions, COSMOS™ prescribes timely, relevant brand experiences across all marketing channels.

COSMOS™ learns, reasons and activates the ultimate engagement with deeper customer insights reducing the anxiety of choice and introducing cognitive optimizations that drive loyalty, customer retention and give experiences a never-before-seen level of personalization.

---

**COSMOS™ Standard Architecture Model**
COSMOS™ activates intelligence.

Real-time cognitive commerce.
COSMOS™ enables marketers to customize the shopping experience by supporting individually tuned merchandising, product recommendations, personalized search and guided navigation. Machine learning capabilities support delivery of targeted and dynamic pricing and promotion. Algorithms learn shopping behavior in real time to update the relevance of the customer experience as it occurs.

Benefits:
- Cognitive insights, relevant and actionable recommendations.
- Deeper customer engagement allows brands to know their customers and respond with the right experience at just the right moment.
- Cognitive algorithms help brands move beyond responsiveness to a synchronized, predictive value chain that mitigates risk and reveals hidden opportunity on a global scale.

Deliver deep personalization.
COSMOS™ uses machine learning to unlock the power of data and deliver highly customized experiences across your entire marketing ecosystem. COSMOS™ helps determine the best available assets and deliver the right creative, message, offer, and call-to-action at the right moment using real-time customer insights and customer-level attribution. Data-driven audience segments are dynamically created and activated across the marketer’s media, commerce, CRM and customer engagement channels.

Benefits:
- Delivers Intelligence-as-a-Service that can be woven into new personalized brand experiences.
- Learns continuously from user interactions and multi-structured batch and streaming data.
- Uses pre-built deep learning models to spot patterns and deviations in complex data sets.
- Leverages existing Hadoop, Apache Spark and data management platforms.
- Orchestrates experiences, insights and learnings using COSMOS™ micro-moments value algorithm.
Optimize media investments.

COSMOS™ RTB optimization models use proprietary machine learning algorithms to activate data and automate seamless execution across RTB and programmatic premium channels, including display, video, social, mobile and emerging channels.

Benefits:

- Determines the right price for each impression.
- Drives higher conversion and return on ad spend using tailored media mixes.
- Identifies the best impressions to buy.
- Data acquisition, segmentation, analysis and activation of online and offline data.
- Device recognition and cross-device targeting using the COSMOS™ universal ID graph algorithm.
Intelligence-as-a-Service

COSMOS™ uses the patent-pending high-frequency data intelligence hub to process millions of signals and personalized streams of data to customize and activate targeted communication across channels, letting marketers engage with customers when they are shown to be most receptive to a message. This enables marketers and brands to use Intelligence-as-a-Service to inform media, commerce, CRM and customer engagement channels simultaneously while providing insight and intelligence.

Benefits:

- Performs real-time analytics for your Internet of Things solutions.
- Streams millions of events per second.
- Correlates across multiple streams of data.
- Processes data at a high throughput with predictable results and no data loss.

INTELLIGENCE

COGNITIVE INTELLIGENCE
- Artificial Neural Networks
- Convolutional Neural Networks
- Face | Vision | Speech | Text APIs

COSMOS™ ALGORITHMS
- Universal ID Graph Models
- Micro-Moments Value
- Fraud Detection
- Churn Prediction/CLTV
- Recommender System
- Social Sentiments Analysis

HIGH-FREQUENCY INTELLIGENCE HUB™ (HFIH)
- Data Transformation Services
- Event Hub
- Stream Analytics
- Measurements
- Real-Time Insight
Data sources

Today’s consumers are elusive and more difficult to retain than ever before. A single customer can look like several people while moving between devices and channels. COSMOS™ data onboarding radically simplifies omni-channel marketing by enabling marketers to acquire, segment, target and engage customers seamlessly throughout their entire journey based on millions of micro-moments, sentiments, contextual data, personal habits and preferences.

COSMOS™ data services are key to unlocking your DMP and activating multi-channel intelligence using machine learning to bring offline data into the online customer experience in a way that protects consumer privacy.

Benefits:

- Data onboarding and segmentation of your first- and third-party, offline, online and CRM data all brought together.
- Activates your offline data for use across your preferred platforms for display, search, video, mobile, attribution and data management.
- Provides a complete view of your customers and target audiences by combining all of your data sources in one place.
- Continually discovers and organizes new, valuable segments for smarter targeting and personalization.
- Makes your ad campaigns more productive by targeting specific segments on any platform.
- Consolidates extensive partnerships with leading data aggregators, media and advertising partners on a global scale.
- Delivers consistent cross-channel experiences for email, mobile, web and social that convert at a higher rate.
Universal ID matching across devices and channels

The COSMOS™ universal ID graph algorithm is a proprietary deep learning graph algorithm that helps marketers connect identities across devices and channels to one customer. It provides the graph network model to seamlessly and securely engage customers with relevant brand experiences as they move between devices and across all digital touchpoints.

Benefits:

- Integration with a variety of DMP platforms.
- Enables customer journey mapping across IDs.
- Deep personalization based on behaviors, sentiments, habits and preferences across the entire customer journey.
- Helps create a more comprehensive customer profile, enabling marketers to target the customer with relevant content, at the right time and through the right channels.
- Provides the customer the ability to opt out.

COSMOS™ Universal ID Graph Model
Timely, relevant and frictionless brand experiences

Marketing is most effective when it delivers the right message to the right person at the right time. Micro-moments are critical touchpoints within today’s consumer journey, and when added together, they ultimately determine how that journey ends. The COSMOS™ micro-moments value algorithm predicts the key moments along the customer journey, where consumers are demonstrating their intent very clearly in micro-moments. The micro-moments value algorithm is the most compelling opportunity along the new journey to engage the customer.

Benefits:

- Predicts the right time to engage a customer with intent-driven micro-moments.
- Engages the customer with an immediate relevant ad and/or content at the right time.
- Connects the dots across screens and channels.
- Maps all the micro-moments of your customer journey.

COSMOS™ Machine Learning Continuum
05. Legal
Privacy

Privacy guidelines and data security are cornerstones of COSMOS™. COSMOS™ is configured to analyze de-identified data and does not need (or want) access to information that could be used to easily identify an individual person. Because COSMOS™ works with a client’s existing data set of first-party and third-party data, it is important for clients to understand how COSMOS™ works and how their data will be analyzed. Clients will be responsible for ensuring that they have obtained all necessary rights from their data subjects in order to use COSMOS™. We are happy to arrange a call or provide an overview of the data uses by COSMOS™ in order to address any privacy concerns.

Patents Pending

Bringing a unique solution to the marketplace is paramount for Razorfish’s approach with COSMOS™. To that end, we are pursuing multiple patents on inventions related to COSMOS™:

1. U.S. Pat. App. No. 15/269,786 “Micro-Moment Analysis”
2. U.S. Pat. App. No. 15/269,642 “Universal Graph ID”
4. PCT App. No. US2016052509 “Universal Graph ID”
06.
Contact Us
For more information about the Publicis.Sapient Cognitive Marketing Intelligence Platform, visit www.cosmos.ai.

COSMOS™ Communication & Media Relations

Brittany Slattery — VP, Communications
@brittslattery

COSMOS™ Global Partnership Program

Samih Fadli — Global Chief Intelligence Officer
@samihfadli