Artificial Intelligence in Advertising

How Marketers Can Leverage Artificial Intelligence Along the Consumer Journey

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Editor's Note

"Speaker's Box" invites academics and practitioners to identify significant areas of research affecting advertising and marketing. The intent of these contributions is to bridge the gap between the length of time it takes to produce rigorous work and the acceleration of change within practice. This edition of Speaker's Box assesses artificial intelligence (AI) in the wake of the Cambridge Analytica scandal, which has increased awareness about the "dark side" of data mining and the use of AI in analyzing and managing social-media data. By way of contrast, the authors focus mainly on the "bright side" of AI. They do so not to dismiss the many legitimate privacy concerns AI raises but instead to illustrate how AI helps consumers and advertisers alike by generating insights in an environment that observes the public's privacy rights.

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INTRODUCTION

The task of understanding the consumer journey increasingly is complex. Consumers express their needs and wants, attitudes, and values in various forms (through search, comments, blogs, Tweets, "likes," videos, and conversations) and across many channels (web, mobile, and face to face; Court, Elzinga, Mulder, and Vetvik, 2009). This seemingly endless supply of consumer-curated data continues to grow in terms of its volume, velocity, variety, and veracity.

Many marketers are turning to artificial intelligence (AI) to transform this (big) data flow into valuable consumer insight. There are, of course, risks involved, such as outcomes related to Cambridge Analytica's historic use of millions of Facebook accounts for political purposes (Solon and Laughland, 2018). Marketers must adapt the AI systems they use to comply with new privacy standards. The same risks, however, create opportunities for marketers and advertisers to be more effective at understanding and reaching consumers at different stages of the consumer journey (Petro, 2018).

To make sense of big data, AI deals with two different types of input data:

- **Structured data:** traditional, standardized datasets, such as basic customer demographics, transaction records, or web-browsing history. AI, with its enormous computing power, runs complex computations on large volumes of such structured data and often produces results in real time.

- **Unstructured data:** about 80 percent of the approximately 2.5 billion gigabytes of daily user-generated data are unstructured (Rizkallah, 2017) and provided as written texts, speech, and images. AI's ability to process large volumes of this type of data—and to do so very quickly—is what distinguishes it from traditional computing systems.

AI preprocesses unstructured inputs to prepare them for subsequent computations, or building blocks. The results of these building blocks vastly outperform our natural intelligence—to advertisers' benefit.

BUILDING BLOCKS OF ARTIFICIAL INTELLIGENCE

The combination of the following key building blocks allows advertisers to deepen their understanding of consumers and the consumer journey.

Natural Language Processing

Natural language processing (NLP) allows AI systems to analyze the nuances of human language to derive meaning from, among others, blog entries; product reviews; and the billions of daily Tweets, Facebook posts, and status updates. Swedbank, the Swedish bank, uses a virtual assistant with NLP to answer customer inquiries on its website's homepage, allowing customer-service employees to focus more on revenue-generating sales without sacrificing service.

Image Recognition

Image recognition helps advertisers understand pictures and videos that people share on social media and that "show" true consumer behavior. Consumers identify details about the offerings portrayed in the image, and advertisers benefit from contextual consumption details (Forsyth and Ponce, 2011). "Selfies" reveal brands used (even when not explicitly mentioned in the post) and users' personal details. When a celebrity shares a photo about an unidentified product, image recognition still recognizes both the product and a potential social-media influencer.

Image recognition also is used in brick-and-mortar retail, which still accounts for the majority of all purchases. San Diego–based Cloverleaf uses image recognition in its "intelligent" shelf-display platform. Equipped with optical sensors, the display collects data on customer demographics, such as age and gender, and scans shoppers' faces to gauge their emotional reaction to the product. The nearer shoppers are to the display, the more personalized the content becomes.

Speech Recognition

Speech recognition allows AI to analyze the meaning of spoken words. Sayint, a call-center services provider, uses AI speech recognition to monitor and analyze customer calls. The technology helps

Sayint to understand customer needs, improve call-agent performance, and boost customer satisfaction.

Problem Solving and Reasoning

When advertisers deploy AI to understand insights hidden in user-generated content, they narrowly define what problem they want to solve and how they will approach the data analysis. These main processes give rise to the all-important detection of patterns in the data, improving the ability to predict future behavior. Advertisers might want to segment their market on the basis of varying psychographics of their customer base, possibly to determine who their "best" customers are and why those customers would buy their offerings over competitors'.

Personality characteristics that are important in people's lives eventually become a part of their language. The way that AI can "reason" with people's social-media comments and posts, in addition, may reveal personality tendencies, values, and needs. Personality profiles depict an individual in terms of the Big Five personality traits—Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism. AI-based profiles, derived from analyzing unstructured consumer-generated data, then can inform future marketing decisions. The North Face uses AI to determine the best jackets for consumers on the basis of available data about where and when they will be using the jacket.

Machine Learning

By detecting patterns in the data, AI systems can "reason" and propose the best options for the consumer's stated needs more efficiently than humans can. What's more, the system remembers everything it has computed previously by storing its memories in a knowledge base and using machine learning to learn from its previous data and problem-solving experiences. The

more unstructured data an AI system processes, the "smarter" it gets and the more fine-grained and insightful its subsequent results are for advertisers. As The North Face accumulates data from jacket searches and combines this information with actual purchases made by customers, the system learns more accurately to predict recommendations that most likely will satisfy the needs of the customer, and it refines the results to prioritize these options.

Machine learning also can help predict customer lifetime value and conversion likelihood. By analyzing patterns and learning from data about the past behavior of consumers in the trial stage of a product, machine learning can ascertain how likely a consumer is to purchase the paid version or predict the future value of a particular customer.

AI gleans information from unstructured data—through personality analysis and sentiment analysis (*e.g.*, through facial coding)—enabling marketers to quantify the affective states of consumers. AI then produces content through the following means:

- **Natural language generation (NLG):** marketers can use AI tools such as Wordsmith for developing human-sounding, original content, from personalized e-mails to news articles, or deploy AI for building advertising content. Saatchi LA trained IBM Watson to write thousands of advertisement copies for Toyota; the copy was tailored to more than 100 different customer segments.
- **Image generation:** constructing lifelike pictures and animated movies on the basis of text descriptions.
- **Speech generation:** providing meaningful voiceovers for advertisements. The film company 20th Century Fox created a trailer for the science-fiction horror film *Morgan* using image, speech, and natural language generation.

TABLE 1

AI in Advertising along the Consumer Journey

	Need/Want Recognition	Initial Consideration	Active Evaluation	Purchase Decision	Post-Purchase Behavior
AI applications in advertising	Rich consumer profiles *Examples:* • Pinterest • Asko	AI-enabled search results, ad targeting Predictive modeling (potential customer) *Example:* • Zendesk	Predictive lead scoring Content curation Emotion AI *Examples:* • Asos • Kellogg's	"Intelligent" purchasing Dynamic pricing Ad retargeting *Examples:* • Staples • Amazon • Tumi	Chatbots in consumer support Propensity modelling 1:1 dynamic CRM Content creation *Examples:* • Autodesk • Wordsmith
Traditional advertising tasks	Build consumer profile and understand needs and wants	Communicate value proposition	Facilitate information access	Substantiate benefit, inform about and incentivize purchase	Manage customer relationship, facilitate brand engagement and loyalty
Advertising objective	Detect and manifest needs and wants	Target and reach consumer	Gain trust and persuade consumer	Achieve commitment and convert consumer to customer	Delight and inspire
Consumer activity	Discover needs and wants	Seek possible solutions	Learn and refine choices	Assess value and commit	Evaluate and respond

HOW AI AFFECTS ADVERTISING ALONG THE CONSUMER JOURNEY

To grasp the opportunities AI creates for marketers requires understanding how communications traditionally "work" along the consumer's decision journey. The consumer journey starts with need recognition, which mobilizes the consumer through the stages of initial consideration, active evaluation, purchase, and postpurchase (Court *et al.*, 2009). In this section, the authors explain the consumer processing activities, the advertising objectives and traditional advertising tasks for marketers at each journey stage. Next, they highlight how the aforementioned building blocks of AI transform these advertising tasks (See Table 1).

Need and Want Recognition

The stage at which a need is triggered has been difficult to track, because it occurs at a category rather than brand level (Batra

and Keller, 2016). Advertisers have relied on methods such as market research, web analytics, and data mining to build consumer profiles for understanding and influencing needs. With AI, it is possible to understand emerging wants and needs in real time—as consumers express them online—and build richer profiles more quickly.

Media company Astro uses Microsoft's AI system Azure for consumer profiling. The system crunches billions of data points in seconds to determine individuals' needs. It then personalizes web content on Astro's platform in real time to align with those consumer interests. As consumers' digital footprints evolve—through social-media status updates, purchasing behavior, or online comments and posts—machine learning continuously updates these profiles.

AI also helps advertisers "manifest" consumers' needs or wants. Pinterest employs

image recognition to learn about individual users' particular style preferences through the images they have pinned on the site. The website then suggests other relevant images that reflect the user's specific preferences, thus facilitating need or want recognition.

Initial Consideration

A key advertising objective when consumers begin to deliberate possible offerings to satisfy their needs or wants is to insert the brand into consumers' consideration set (Batra and Keller, 2016). Advertising tasks include increasing the brand's visibility and emphasizing key reasons for consideration. Advertisers could accomplish this goal, for example, through search optimization, with paid search advertisements, organic search, or advertisement retargeting.

Advertisers can use AI-powered search to identify, rank, and present results that most likely will meet the information

needs of the consumer at that specific time. Google Adwords helps advertisers make clearer distinctions between qualified and unqualified leads for better targeting. Using AI, Google analyzes search-query data by considering not only keywords but also context words and phrases, consumer activity data, and other big data. From there, Google identifies potentially valuable subsets of consumers and more accurate targeting. Zendesk, a customer-service software company, increased the quality and volume of its leads after using AI to build richer consumer profiles and targeting its advertisements to Facebook users who matched these profiles.

Active Evaluation

When consumers narrow down their list of brand choices, advertising aims to instill trust in the offering and persuade them that they are making the best choices (Batra and Keller, 2016). One tactic is targeting consumers who are high in purchase intent and providing them credible and persuasive content.

AI supports these tasks in three important ways:

- Predictive lead scoring, through machine learning, allows marketers to make accurate predictions about the purchase intent of consumers. A machine-learning algorithm runs through a database of verified existing customer data; recognizes trends and patterns; and then, after appending additional external data on consumer activities and interests, creates robust lead profiles for advertisers.
- Machine learning and image, speech, and natural language generation enable advertisers to curate content while learning from consumer behavior in real time, adjusting content on the fly. U.K.-based online fashion retailer ASOS uses Microsoft's Azure for real-time calculation of product relevancy and the

likelihood of a website visitor viewing, saving, adding to a cart, and ultimately buying a product. Product recommendations are generated in real time as users browse product listings.

- Marketers use emotion AI to understand what consumers are saying and how they feel about their brands publicly, such as in reviews, blogs, or videos, and to pretest advertisements. Kellogg's used Affectiva's emotion AI software to help devise an advertising campaign for its Crunchy Nut cereal, eliminating advertisement executions when viewers' engagement dropped on viewing the advertisement multiple times.

Purchase

As consumers decide how much their preferred brand is worth and how much they are willing to pay, advertising aims to move them out of the decision process and into action by reinforcing the value of the brand compared with its competition (Batra and Keller, 2016). Advertisers can communicate this value by emphasizing convenience and information about where to buy—bolstered by reassurances about guarantees, warranties, or return policies—or offering purchase incentives.

AI can alter the purchase process for consumers completely. Office-supply retailer Staples did this when it transformed its "Easy" button into an "intelligent" purchasing system that lets business customers order supplies by means of voice commands, text, or e-mail. Marketers also can determine the "sweet spot" for pricing. This is known as dynamic pricing and encompasses real-time price adjustments on the basis of information such as demand and other consumer-behavior variables, seasonality, and competitors' activities. During Black Friday 2017, Amazon changed prices on 28 percent

of its inventory at least once a day using dynamic pricing enabled by AI.

Postpurchase

At this stage, consumers evaluate their satisfaction and consider whether they want to repurchase the product, perhaps engaging in word of mouth. Advertisers, in turn, aim to delight by reinforcing that the brand is performing well against customer expectations or by rectifying potential problem areas (Kietzmann and Canhoto, 2013).

AI-enabled "chatbots" help advertisers engage with customers postpurchase. The software developer Autodesk uses a virtual agent to return customer answers quickly. It relies on NLP and machine learning to recognize and extract the intent, context, and meaning behind inquiries, thereby reducing the resolution time for inquiries from 1.5 days to an average of five minutes.

Marketers also have the ability to identify their most valuable customers. Known as propensity modeling, this AI application crunches big data to assess customer lifetime value, likelihood of reengagement, propensity to churn, and other key performance measures of interest. Once they know these metrics, advertisers can craft personalized communication as part of their customer-relationship management campaign to encourage the desired behavior, adjusting the communication during the campaign flight on the basis of the customer's response.

CONCLUSION

AI has shifted the way advertisers understand and guide consumers. In the future, new ways of consumer-generated data mining will drive consumer insight, and AI will become the ultimate test for privacy. With the help of machine learning, advertisers will be able to collect consumer data from many sources imperceptibly, combine those data, and mine them to deliver on-the-spot consumer insights. The

advertisers then can use these insights to communicate actively back to consumers.

When Google's chief executive officer, Sundar Pichai, introduced virtual assistant Google Duplex in May 2018, he provided a glimpse into the not-so-distant future of AI. Duplex, which uses NLG to make calls to schedule restaurant reservations and hair appointments and to find out stores' holiday business hours (Cipriani, 2018), sounded eerily human, prompting immediate concerns about the takeover of AI and the need for chatbots to identify themselves as such. These emerging technologies make it entirely conceivable that AI soon will be woven so imperceptibly into the fabric of traditional advertising that it becomes indistinguishable from it—with all of its risks and promises.. **JAR**

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