



CHECKLIST REPORT

2016

Marketing Analytics Meets Artificial Intelligence: Six Strategies for Success

By Fern Halper and David Stodder

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OCTOBER 2016

TDWI CHECKLIST REPORT

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FOREWORD

Marketing and marketing analytics are undergoing an evolution. Gone are the days when it was acceptable to send out bulk email or other mass communication to an entire customer list for a campaign. Marketers today understand that they need to be much more selective. They have to deal with a multitude of channels and want to understand the customer journey across them. They need to engage potential customers who are increasingly both tech- and data-savvy. They are more accountable than ever to prove the value of marketing programs.

Marketing analytics is about leveraging insight from data analysis to make marketing more efficient and effective. It involves analyzing, measuring, and optimizing marketing efforts so that marketing dollars are not wasted and adjustments to campaigns can be made more quickly. In order to accomplish this, marketing departments are using advanced analytics that focus on customer behavior, customer intelligence, and marketing optimization. In fact, we see in TDWI research that marketing is often one of the first departments in an organization to utilize advanced analytics such as next best action recommendations or churn analytics. Vendors are helping them along by providing tools and solutions that often include sophisticated analytics under the hood.

Some of these newer tools and technologies use components of artificial intelligence (AI). AI has been around for decades, but has seen a recent resurgence in interest as data size and diversity continue to grow and the cloud becomes a popular option for quickly and economically scaling compute power and data storage. AI and its subcomponents (machine learning, cognitive computing, and even deep learning) are being woven into the analytics arsenal of various departments at organizations across industries.

This Checklist explores how AI can be used to enhance marketing analytics and to help companies both better understand their customers and deliver a great customer experience. It also provides practical advice on how organizations can use what they may already be doing to become more effective in marketing.

AI AND ENABLING TECHNOLOGIES

AI is a series of capabilities that include technologies such as machine learning, natural language processing, and cognitive computing, enabled by techniques such as optimization and decision management.

- **Machine learning:** This involves building systems that can learn from data to identify patterns and predict future results with minimal human intervention. The computer learns from examples using either supervised or unsupervised approaches. Historical data with known outcomes is provided to the algorithms to train them. The output is then used against test data to determine how good the model is. Machine learning is often used in marketing to determine the probability that a customer will churn.
- **Natural language processing (NLP):** NLP involves analyzing, understanding, and generating responses to ultimately enable interfacing with systems using human rather than computer languages. For text, NLP often uses semantics to parse sentences for entities (people, places, things), concepts (words and phrases that indicate a particular idea), themes (groups of co-occurring concepts), or sentiments (positive, negative, neutral). Today, NLP is often used in text and social media analytics tools to analyze issues and opinions.
- **Cognitive computing:** This involves learning systems that use data mining, pattern recognition, and natural language processing to interact with humans. Natural language search uses components of cognitive computing.
- **Optimization:** Optimization involves deciding how to best use limited resources to find the best option for a given set of constraints through maximizing desired factors and minimizing undesired ones. A popular example of optimization occurs in the airline industry. Airlines use optimization to sift through millions of flight itineraries to derive the optimal price at any point in time to maximize their profits.
- **Decision management:** This involves systems that automate and optimize repeatable and operational business decisions. Typical examples include credit card or car loan approvals, or recommendations to customers. Decision management technology usually employs some sort of rules engine in conjunction with predictive models.

Many of these technologies are already in use—together and separately—to help improve marketing analytics.

NUMBER ONE

ENABLE REAL-TIME DECISION MANAGEMENT AND NEXT BEST OFFER/ACTION WITH MACHINE LEARNING AND AUTOMATION

Most marketers are familiar with the concept of next best offer. The idea is to provide customers with the offer, product, or promotion that is most relevant to them in the context of the task they're trying to fulfill. For instance, a beauty salon might offer a client who just had a manicure a coupon for a discount on a pedicure. A media streaming service might suggest a show to watch based on the show a customer just watched. Similarly, next best action considers alternative actions during a customer interaction, such as with a call center agent.

Typically, marketers determine a set of rules based on what they *think* they know and then provide a predefined offer as a next best offer. For instance, a marketing organization might send coupons for baby products to all women who sign up for a baby registry. Different coupons might be sent out at different times (when the baby is born, when it is six months old, etc.). Some organizations segment the customer base to understand the profile of similar customers. They then provide customers in a common segment with similar promotions.

Marketing analytics can build on this kind of analysis to generate personalized, targeted offers that provide customers with what they need rather than blanketing customer segments (or all customers) with potentially irrelevant offers. Increasingly, organizations are accomplishing this using technology such as machine learning and automated decision management.

With machine learning, organizations can understand how small customer segments, microsegments, or even single customers will respond to an offer. Typically, a learning model is trained with historical behavior—how customers with similar characteristics responded to an offer.

This model may then be integrated into the decision management technology that uses rules—such as to determine if a customer is eligible for a certain product—along with the model to provide the next best offer to the customer on the next interaction regardless of channel. A contact history is also maintained to understand how the customer might have already responded to a similar offer. The decision management tool can track how customers respond to offers and automatically adjust the offers accordingly.

NUMBER TWO

USE AI AND MACHINE LEARNING TO SHARPEN CROSS-SELLING AND UP-SELLING

One of the primary goals of marketing is to influence customers to expand their purchasing so that your company can increase revenue and improve margins. Thus, effective cross-selling and up-selling are vital. Analytics and AI techniques such as machine learning enable organizations to be smarter in how they cross-sell and up-sell. Organizations can use data-driven technologies and practices to move away from broad, generic offers toward targeted, personalized recommendations and offers.

Cross-selling is about enticing customers to buy complementary products or services that increase the average revenue per customer. Effective cross-selling is important to building a broader relationship with a customer based on shared commitments and increased loyalty. Strong complementary products and services can be competitive differentiators as well. Many firms introduce product and service innovations that diversify their portfolios and allow expansion into new markets in this way.

Up-selling complements cross-selling. Organizations use up-selling strategies to encourage customers to upgrade to more profitable products and services rather than to simply purchase more. In some cases, up-selling is a strategy shared with partners and affiliates, who also realize benefits from better margins. Marketing contributes by educating customers on the benefits of adding additional products and services or upgrading to higher-level ones.

Relevance to each customer is critical to effective cross-selling and up-selling, and this is where analytics and AI often contribute the most. Machine learning can enable organizations to learn from huge volumes of data generated by transactions, customer behavior, previous campaign performance records, and customer interactions across channels to identify and predict the most relevant recommendations or offers to cross-sell and up-sell. Prescriptive analytics efforts that use such machine learning algorithms enable firms to go beyond just gathering predictive analytics to using the insights to determine which cross-sell or up-sell offers should be made in real time by either humans or automated decision management systems.

Organizations should evaluate how implementation of analytics and AI techniques such as machine learning in their cross-sell and up-sell programs could improve accuracy in matching the right offers and recommendations with the right customers. Organizations can use machine learning to mine larger volumes of data and derive actionable, prescriptive analytics faster so that relevant offers can be made at the point of decision.

NUMBER THREE

IMPROVE UNDERSTANDING OF THE VOICE OF THE CUSTOMER WITH COGNITIVE COMPUTING AND SENTIMENT ANALYSIS

Gaining insight and understanding into customers and their opinions and preferences is a major goal of marketing analytics. Marketers want to understand what customers think of their products, including what they like and don't like about them. They want to understand customer preferences and needs. Some organizations analyze clickstream data to see what customers might want. Others conduct surveys. Some set up online review sites where customers can rate their products.

All of these are good starting points, but customers are stating their opinions and preferences in many ways. They are sending emails to organizations. They are tweeting about products online. They are posting online reviews. They are calling customer service agents to complain. All of this involves natural language processing, which can also augment customer analytics techniques such as predictive modeling, data visualization, information management, and segmentation.

If your organization is using text or social media analytics tools, you might already be using some sort of NLP technology. As described above, NLP extracts meaning ("semantics") from text. This is an important component of cognitive computing, too.

For example, a marketing department for a health-and-beauty company might launch a campaign for a new product. Based on sales, marketing might think that it is doing well. However, in reality, the customer might not like the product and may take to social media to complain about it (perhaps the product causes skin to break out). If the company can analyze those tweets and reviews using NLP technologies, they will be able to understand what people are talking about, their sentiment (positive, negative, neutral), and even the intensity of their feelings (from the words used in the tweets).

Additionally, although it is one thing to know that your brand reputation is being compromised, it is another to act on it. Some companies use technology to respond to negative social media in real time. Others blend social media data with additional customer data to provide them with special offers or to encourage another next best action (as described in Number One).

NUMBER FOUR

EMPOWER CUSTOMER SERVICE AND SUPPORT WITH COGNITIVE COMPUTING AND NATURAL LANGUAGE PROCESSING

The customer experience includes the entire interaction that a customer has with a company. This includes customer service and support. It doesn't matter how good the meal is if the service is awful. For many companies, the customer experience often involves dealing with a customer service agent. Cognitive computing and NLP can enhance this in several ways.

- **Call routing.** Many organizations will route calls to the same call center, regardless of what the individual customer might need. Some organizations have seen an opportunity to personalize this by linking call center support to loyalty programs or some other information about the customer (e.g., amount spent). Based on status, a customer is then routed to a specific call center if he or she has a question. NLP can take this even farther by combining existing data on the customer (e.g., loyalty status) with specific details of the reason for calling.

As described in Number Three, NLP technologies can parse spoken language to understand semantics and meaning. The same kind of technology can translate voice to text and then route calls to customer service and support. For example, a customer might call into a call center because they have a problem with their phone service. The call can be routed using NLP to an agent who specializes in troubleshooting that service. This leads to a much improved customer experience.

- **On-the-fly recommendations to a call center agent.** Taking automated routing a step further, NLP and machine learning together can make suggestions to the customer service representative who answers the call regarding what kind of offer (see Number Two) to speak to a caller about, if appropriate. The customer service representative does not need to know that these technologies are operating behind the scenes.
- **Natural language interaction.** Cognitive computing involves NLP to enable more conversational interactions with software. That means that the software can be used for automated customer Q&A and other interactions in a more natural way. This becomes part of the customer service experience.

NUMBER FIVE

TRANSFORM WEB ANALYTICS INTO DIGITAL INTELLIGENCE

Nothing changed marketing more than the advent of online channels. Almost overnight, any company that engaged with customers online needed Web analytics to measure, analyze, and report on Web traffic. From corporate executives to marketing managers, everyone wanted to know how the organization was doing on the Web. They wanted at least to see simple clickstream analysis reports, particularly after important marketing and advertising campaigns. At times, whether warranted or not, the fixation with Web analytics overshadowed analysis of customer engagement in other channels.

Today, organizations are realizing that the Web is not an island to be analyzed in isolation; it is vital to the performance of all channels. To be customer-centric, organizations need to integrate collection and analysis of data about online customer activity with that from their other channels to gain a complete view. They need to understand how marketing campaigns and engagement in Web channels relate to those in other channels, including mobile. Unfortunately, Web analytics can be hard to integrate with data and analytics generated in other channels because most Web analytics lives in its own silo and uses data that is highly aggregated and structured specifically for Web analytics reporting.

Some in the industry call the new, holistic approach to Web analytics “digital intelligence.” Rather than limiting Web analytics to canned reporting on siloed data, digital intelligence is about integrating it into a multichannel perspective focused on customer-centric strategies and smarter personalization of marketing and engagement. Part of the motivation for digital intelligence is to increase speed. Marketing decision makers need access to fresh data and real-time analytics from all channels so that they can optimize campaigns, improve segmentation, and act to reduce customer churn.

AI and machine learning allow organizations to more rapidly analyze and learn from high-volume, varied, and detailed data—whether structured, unstructured, or semistructured. These technologies can help organizations revise their strategy for Web analytics. They should focus on realizing the concept of digital intelligence—that is, integrating Web analytics with other data and analytics to gain a comprehensive view of customers. As a goal of digital intelligence, organizations should make Web analytics data available for AI and machine learning so that actionable customer insights may be derived from all available channels.

NUMBER SIX

OPTIMIZE MARKETING WITH ANALYTICS AND MACHINE LEARNING

As organizations strive to do more with less, marketing campaigns need to be efficient and effective so that they return value, do not waste customers’ time with irrelevant offers, and stay within budget. The quest to achieve these objectives is *optimization*, which has long been vital for supply chains, manufacturing, and other process-oriented activities. Now, marketing optimization is hitting the mainstream.

As marketing grows in complexity—with numerous campaigns running across multiple channels and operating under a variety of constraints, including budgets, privacy policies, and more—optimization becomes critical. The need for speed is also driving demand for optimization as organizations attempt to adjust offers at or near real time, while they are actively engaged with customers. Marketing optimization can also drive automated decision management. Thus, organizations need to make optimization a strategic priority and evaluate how they can use software to achieve marketing optimization goals.

It would be no exaggeration to say that optimization runs on the power of analytics, with AI and machine learning on the leading edge. Analytical optimization enables organizations to use mathematical techniques to determine how to best direct marketing efforts given certain constraints, with the goal of reducing inefficiency and defining alternatives for improvement. Analytics and optimization together enable organizations to factor in variables, use tools to run “what-if” scenarios and testing, and apply optimization formulas to balance goals and constraints. They can also use analytics to look at performance to determine whether their marketing optimization decisions were effective across channels and how they could be modified to better reach desired outcomes.

AI techniques such as machine learning help organizations sift through large and varied data volumes to become more precise in defining constraints, such as those based on microsegmentation. Predictive analytics based on machine learning can help organizations discover the probability that certain customers or segments will respond to offers, which can then be plugged into optimization engines. Machine learning can help spot patterns or changes in customer behavior more quickly, enabling marketing to respond in real time by adjusting offers. Organizations should evaluate how advanced, predictive analytics—aided by machine learning—can help them gain a clearer understanding of how to optimize marketing to reach desired outcomes.

CONCLUSION

MOVE FORWARD

The nexus of big data analytics and the various forms AI—including predictive analytics, machine learning, and deep learning—underpin well-informed and efficient customer interactions that benefit both customers and businesses. Through AI, marketing programs can adapt and evolve through exposure to new data over time, and can play a critical role in business’s ability to intelligently update existing processes without being limited by the speed of humans.

The previous examples should provide some reassurance that although AI sounds futuristic, there are projects that organizations can implement today that use the concepts of AI. These can involve using certain algorithms—such as machine learning and NLP—as well as automating analytics using decision-management tools and techniques.

Vendors are also providing solutions that make these algorithms easier to use via guided interfaces that hide the complexity from the user. The time is right for organizations to evaluate the latest marketing analytics technologies to determine if AI can help them meet business objectives.

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TDWI Checklist Reports provide an overview of success factors for a specific project in business intelligence, data warehousing, or a related data management discipline. Companies may use this overview to get organized before beginning a project or to identify goals and areas of improvement for current projects.