

When a customer explores a web page, what action should the company take next to better serve that customer's information needs and strengthen that relationship? How can we make all our marketing actions more customer-centric? Cisco IT is now helping our marketing teams answer these questions by applying analytics, artificial intelligence (AI), and machine learning (ML) technology to very large data sets, all on Cisco® UCS® servers.

"Next Best Action" (NBA) is a marketing IT solution that focuses how we can better serve small and midsize customers who do not have an assigned Cisco sales team. These customers typically initiate an interaction with Cisco by visiting Cisco.com to look for information on a product, event, or local sales office.

In the past, we tried to sustain communication with these customers by sending a pre-written email, displaying an online chat pop-up, or initiating a direct phone call. All of these methods have limitations. Emails are inexpensive, but customers often don't respond and may perceive those messages as spam. Chat is expensive, cold calls even more so, and both can annoy customers. Yet the Cisco corporate websites produce a wealth of data about what might be a better way to engage customers, if only we could filter that data in a timely and actionable way.

The NBA solution addresses this need. The Cisco Marketing Analytics team and Cisco IT worked with consultants to build NBA as an AI platform that collects and analyzes all customer-interaction data from Cisco websites and our customer relationship management (CRM) system. This data helps identify which customer was contacted in which ways and with what content. The data also helps us determine whether the outcome of that contact was positive—for example, if the customer clicked on a link or placed an order.

Deeper Marketing Analytics with AI and ML

The first pilot project of NBA was for the email use case. Our goals for this project were to better identify which customer should receive an email and send a message with relevant content. We used spam reduction and click-through rates as the measurement of success. In phase 1, the AI analysis helped the marketing team identify specific next actions for email marketing based on factors such as the customer type, technology or product type, and previous interactions or content received.

Phase 1 results showed that the initial AI selection of a next action for email contact allowed Cisco to reduce the number of email messages sent by a factor of 10. Yet the email messages we did send had a customer click-through rate about **4 times better** than Cisco's previous campaigns, indicating the NBA messages were more relevant.

In phase 2, we began to apply machine learning algorithms to improve the intelligence of the email marketing. These tests generated an early **8 times improvement** in the customer click-through rate for the emails sent in this phase. We expect to continue improving these response levels as the ML technology gains more insights from the customer data.

We are extending the NBA analytics to two other marketing use cases. The click-to-chat use case has a goal of identifying which customers are most likely to accept a chat button that we display proactively on a webpage. We also want to find ways to improve efficiencies for the agents in our contact center who handle these chat sessions.

In another use case, we want to better target customer phone calls initiated by the Cisco sales contact centers. Our goal for this use case is to better identify customers who are ready for a call, give the customer a better experience during the call, and improve the efficiency of the contact center. As we run

the NBA analysis for each use case, we also collect data that allows us to refine and train the ML models for future runs.

In all these cases, the NBA results are leading to several business benefits for Cisco, including:

- Increased revenue from more effective marketing
- Higher customer satisfaction because they receive more relevant and timely information from Cisco and fewer unwanted emails or other sales contacts
- Reduced costs by automating more marketing activity in the small and midsize customer segment and improving contact center efficiency

[An Architecture Ready for Demanding Analytics](#)

The NBA tools and data sets are hosted on dedicated Cisco UCS C240 M5 Rack Servers, which use two NVIDIA Tesla P100 graphics processing units (GPUs) to deliver the performance needed for fast analytics and training of ML models, regardless of the data-set size. These servers operate in the Cisco IT Hadoop big data cluster, which is installed across two Cisco data centers. The Cisco Application-Centric Infrastructure (ACI) in the cluster supports the high levels of server performance, stability, and reliability needed for processing large analytics workloads.

Data received from Cisco websites can reach millions of records per day, indicating the need for a high-capacity processing platform. In the initial NBA projects, this Cisco UCS infrastructure ran approximately 1000 trained ML models that processed more than 12 TB of data.

We are beginning to explore offloading high-volume and model-training ML workloads to the on-demand computing resources available on Google Cloud Platform. This option will give us the flexibility needed for massive, short-term ML workloads that need extra computing capacity in order to run in a reasonable timeframe. We will access that extra capacity as needed, with lower costs than using dedicated Cisco IT servers and infrastructure.

[Next Step: Expand the Marketing Analytics Service](#)

As of early 2019, we have run 25 pilot projects for NBA analytics in seven countries. Based on the success of these projects, we are now developing a self-service user platform that will enable all Cisco marketing teams to use NBA analytics for their products and customers.

[For More Information](#)

[Cisco UCS C240 M5 Rack Servers](#)
[Cisco and Google Cloud](#)