Retail

**Staples Inc.**

Revolutionizing customer service with IBM Watson and the push of an Easy Button

Staples Inc., founded in 1986 and headquartered in Framingham, Massachusetts, in the US, is a global provider of business products and services. The company serves Fortune 500 and Fortune 1000 companies, small businesses, and consumers throughout North America, Europe, Australia, South America and Asia. It operates nearly 1,900 retail stores and is the fifth largest e-commerce company in the world, through its Staples.com website and contract business. In 2016, the company reported USD 21 billion in annual sales and employed approximately 75,000 people.

**Business challenge**

To provide anywhere, anytime service, Staples sought to remove the friction of ordering from its stores and websites and instead use its Easy Button to become part of the customer’s daily routine.

**Transformation**

Using the natural language processing (NLP) and machine learning capabilities of the IBM® Watson™ platform and a host of Watson cognitive APIs, Staples transformed its Easy Button into an intelligent ordering ecosystem that business customers can use to order supplies easily using voice, text or email.

Ryan Bartley
Director of Mobile Strategy and Applied Innovation, Staples Inc.

**Business benefits**

**Higher order frequency**
expected by embedding the ordering process into office managers’ work routine

**Increased order sizes**
anticipated by enabling customers to order using voice, text and email across a variety of devices

**Improved service scores**
predicted by facilitating anywhere, anytime service across channels

“**It was a wake-up call for us—that cognitive solutions are real and the tooling around them [is] powerful. That’s what got us really interested in Watson.**”

—Ryan Bartley, Director of Mobile Strategy and Applied Innovation, Staples Inc.

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A push for modern service

Staples is widely recognized as having pioneered the concept of the office products superstore. Since its first store opening in 1986, the company has stayed true to its commitment to make shopping and saving easy for customers. In today’s global and multichannel marketplace, however, shoppers need and expect modern service: the ability to shop whenever, however and wherever they want. This fundamental shift in the relationship between retailers and consumers prompted the retail giant to reexamine its traditional business model.

Ryan Bartley, the company’s Director of Mobile Strategy and Applied Innovation, elaborates: “Historically, we’ve been a supplier of office supplies. A change within the industry forced Staples to start thinking about moving beyond its core business and customer offerings, and transition into a services company.”

To spearhead the challenge, Staples formed an Applied Innovation organization, a group of designers and technology experts headed by Bartley that focuses on developing innovative solutions for business-to-business (B2B) services and utilities. As part of the research process, the team visited and interviewed numerous large- and small-business customers to better understand the daily work life of office managers and how they order office supplies.

The group’s product manager, Ian Goodwin, who led the research, comments on the experience: “Office managers deal with all kinds of things throughout their day that make their jobs difficult, such as leaking pipes or broken vending machines. They don’t have a lot of time to go online to order supplies, talk to customer service reps or check the status of an order. We wanted to remove constraints and make the process of ordering supplies as easy as possible.”

The team concluded that to provide modern service, Staples needed to look beyond its destination stores and websites and, instead, embed itself into the workplace, becoming part of the office manager’s workflow. But how? When the Staples chief executive officer (CEO) and chief digital officer (CDO) challenged the team to take advantage of the company’s iconic Easy Button, the team had its answer.

“The Easy Button is very well-known; you’ll find one in almost any office in America,” explains Bartley. “Traditionally, it’s a big plastic button that says a couple of things when you push it. Now we needed to take its physical form and incorporate technology in such a way that customers could push it and things would happen, like magic.”

The next generation of easy

The journey to developing an intelligent Easy Button began with investigating various technologies and platforms to better understand what kind of software was currently available and what it was capable of doing. Cognitive computing surfaced as the most exciting technological advancement.

“When we started looking into cognitive solutions, a senior product manager who is also very technical took it upon himself to demo the Watson platform,” recalls Bartley. “In a single afternoon, he put together a simple but powerful conversational platform. It was a wake-up call for us—that cognitive solutions are real and the tooling around them [is] powerful. That’s what got us really interested in Watson.”

To be thorough, the team examined other cognitive platforms from major market players and tried to project where those platforms might be in 1 – 3 years. The IBM Watson Developer Cloud platform, with its extensive set of services, tools and support, stood out. “We felt that IBM had, by far, the largest lead in terms of where cognitive was going and that the Watson team would be in the best position to help our business users,” says Bartley.

“We wanted to remove constraints and make the process of ordering supplies as easy as possible.”

—Ian Goodwin, Lead Product Manager of the Staples Easy System, Staples Inc.

Today, the enhanced Easy Button is part of a larger Staples Easy System, an intelligent ordering ecosystem that allows Staples’ business customers to order supplies quickly and easily from a variety of devices using voice, text or email input. The system takes advantage of the natural language processing (NLP) and machine learning capabilities of the Watson platform as well as numerous Watson services. The technologies work in unison to understand and process customers’ spoken words, translate speech to text, extract the nature of their requests, and use voice feedback to provide order confirmations and product recommendations.
The Easy Button itself is outfitted with sensors and wireless networking technologies that communicate with the company’s ordering, commerce and customer data enterprise systems through an underlying integration platform. The IBM Watson Conversation service, a platform as a service (PaaS) technology, puts a conversational interface on the button so that customers can interact with it using natural language. The Watson Speech to Text and Text to Speech services work together to process customers’ utterances and enable utterances from the Easy Button device.

When a customer speaks into the Easy Button, Watson Conversation works to understand the customer’s intent and entities referenced. Currently, the system is trained on five intents, or skills: product ordering, product reordering, shipment tracking, checking on reward summaries and processing back-to-school lists from scanned images provided by customers. Entities are office products contained in the company’s vast catalog, such as pens, toner and paper, each of which has its own stock keeping unit (SKU).

After Watson Conversation recognizes the intent and entity of a request such as, “I want to reorder black pens,” it calls the Staples personalization engine. That engine uses the Watson Retrieve and Rank service and custom-built analytics to comb through the customer’s purchasing history and identify the specific SKU, or in this example, pen, the customer historically orders. If the system is highly confident it has identified the correct SKU, it uses voice feedback to confirm the purchase with the customer, and the transaction is complete. If the confidence score is medium, the system suggests a variety of pens based on past orders so that the customer can select the correct product.

To provide customers with anytime and everywhere service, Staples is also using its Easy Button software platform with Watson Conversation to support all of its chat experiences across its many channels, including the Staples website, the company’s chat and mobile app, and third-party messaging platforms such as Slack and Facebook Messenger.

“Watson Conversation helped us immensely and changed the trajectory of the project,” says Goodwin. “The visual tooling around it made everything significantly easier—easier to train Watson on our product catalog and intents, and easier to see where we were having issues. It’s fantastic.”

The Staples Easy System with Watson also learns over time. For instance, if it cannot confidently return a customer’s request—perhaps because it hasn’t been trained on the intent or the customer makes a request it can’t understand—it forwards the request to a live agent who can help the customer. In cases like this, Staples feeds the agent’s conversation back into the Watson system so that it can learn the dialog and successfully manage similar requests in the future. “We’ve set up an end-to-end learning system so that we can continue to improve all of our chat and voice channels around specific intent,” says Bartley.

Anywhere commerce and service

The ultimate goal of the Staples Easy System and the Easy Button is to remove friction from the ordering process and enable office managers to place orders wherever, whenever and however they want. Goodwin explains: “Calling customer service and waiting on hold, or logging on to a website, searching through rows and rows of products, checking products out…it can be a hassle. Ordering supplies should be easier. The Easy Button makes it simple and magical. You tell it that you need pens and it knows exactly what you mean.”

Bartley sees using cognitive capabilities across the Staples brand. “Anywhere we’re building or using software to help our customers or associates, we’re thinking about how cognitive services from Watson can be at the heart of that software product. We think it can support many different spaces.”

For instance, by integrating NLP and machine learning technologies with its existing big data and personalization platforms, Staples can gain a deeper understanding of customers and their preferences. This kind of thinking has Staples leading the B2B market in what it calls conversational commerce—the ability to deliver anytime, anywhere service and commerce capabilities using voice, text and email.

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Staples is rolling out the system in phases, starting with launching it on its mobile chat channels. Currently, more than 10 percent of Staples’ Apple app users are interacting with the company using chat. With the introduction of Watson technology, Staples expects that number to increase. It also predicts higher order frequency, larger average order sizes and improved customer service scores.

In October 2016, as part of its alpha testing, the company will offer a pilot version of the system to a select group of customers and use the resulting feedback to inform product and software design and further train the system on use cases. Even in the project’s early phases, demand for the Easy Button is high. “We already have large enterprise customers reaching out to become Staples customers, mainly because of the Easy Button. They want it in the office and to be part of it,” says Goodwin.

Beta testing will begin in November and focus on augmenting the system based on customer experiences, releasing a companion app, and enhancing hardware and software with 3G wifi and 2-way voice capabilities. It will also publish the system to other chat channels across Staples. Over time, as customer requests evolve, Staples will add new skills to the system. “Eventually, we think there will be 5 – 10 dominant use cases, but we’ll let the customers decide which are most relevant to them,” says Bartley.

In the future, the company plans to augment its system by incorporating the IBM Watson Tone Analyzer service to better understand customers’ emotions, personality traits and language styles, and the IBM Watson Sentiment Analysis service, part of the IBM Watson AlchemyLanguage collection of services. The API will help internal customer service agents gain insight into customers’ attitudes and opinions.

“A year ago, we wouldn’t have been able to do this,” says Bartley. “Because of the work of IBM and others, software development is at an inflection point where cognitive services are now available to everyone and can power unique and differentiated experiences.”

Working with IBM and the Watson Developer Cloud hosted on the IBM Bluemix® platform has been—and continues to be—a positive experience for the team. “We’ve had some really good conversations with not only the Watson team, but also the commerce teams and leaders at IBM,” concludes Bartley. “The Watson team is very interested in our use case because we’re pushing some of the boundaries of how to connect directly with customers.”

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