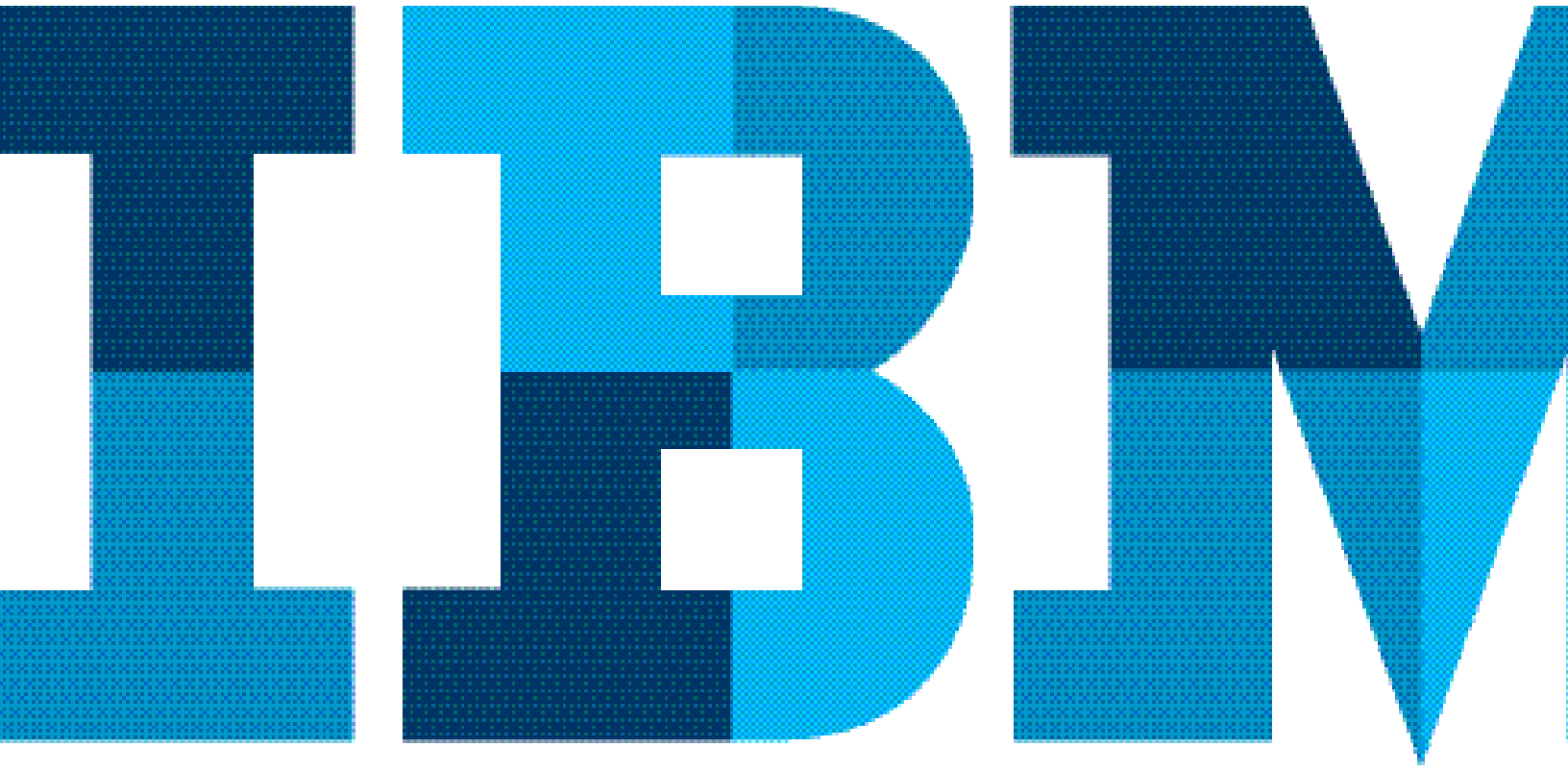
January 2016

Under the covers: How Watson Engagement Advisor Works



IBM

Contents

2 Introduction

2 Watson Engagement Advisor

3 Applying the 80-20 Rule to Customer Queries

4 Behind The Scenes

5 Addressing Long-Tail Questions

Large organizations today face a major challenge when providing customer service. They must meet the rising demand from customers that they deliver a superlative experience anywhere, any time. But they must also do so with lower operational costs.

Over the past few years, businesses have been able to meet the need for the second requirement — lowering operational costs —by automating customer service. Far too often, however, this has been at the cost of customer satisfaction. Call Center automation technologies are prime examples of the problem.

As customers are routed through phone trees ("Press 1 for Billing Inquiries"), the organizations attempting to serve them are indeed reducing operational costs. They are also, however, creating the conditions under which customers will jump ship to competitors that can provide the outstanding, always-available service that they increasingly require.

The bar for customer experience has been set very high by the customer-centric giants of the retail and technology world. Millennials in particular — those born between 1982 and 2000 — expect and demand that all interactions with their service providers are of a consistently high quality. In the United States, this segment's buying power will surpass that of any other single generation in 2017.(1)

These factors have many firms rushing to radically improve self-service options. At the same time, the requirement to minimize operational costs remains as strong as ever across all industries.

While the dual imperatives for excellence and affordability are seemingly at odds with each other, cognitive computing solutions from IBM Watson can provide an answer to both.

Watson Engagement Advisor

IBM Watson Engagement Advisor is a cognitive assistant. It allows consumers to engage with an organization on their own terms, in natural language and from any device that they like. Watson—unlike earlier automated customer service systems—actually understands and responds appropriately to the complexities of natural language queries. Customers engaged with Watson get served more quickly through intelligent automation, freeing up agents' attention for only the most difficult requests.

The cognitive process making this possible has evolved from a system that competed successfully against top human contestants in the NBC TV game show, "Jeopardy," in 2011. As capable as Watson was then at understanding and responding to natural language, it has advanced significantly since. Watson is a combination of many different technologies working together and remains quite distinct.

Applying the 80-20 Rule to Customer Queries

In studying the way that customers engage with organizations, an important pattern emerges. While the number of different questions that customers tend to ask is very high, it becomes apparent that the intents behind these questions is very much smaller. That is to say that, most of the time, most customers are just asking variations of the same questions.

To illustrate this, we can plot the number of questions and intents on a graph. In Figure 1) we can see that the bulk of questions asked actually relate to a relatively small number of intents, typically numbering in the hundreds. That means that an automated system designed to tackle these "short-tail" questions will be able to answer a large majority of queries, as long as it can parse the underlying intent of a given question, regardless of how it is phrased.

Clearly, it is of fundamental importance to be able to effectively deal with these "short-tail" questions and the design of any automated system should focus on doing that well in the first instance.

The rest of the questions, the "long tail," is comprised of more esoteric questions that don't come up repeatedly. In fact, they may be unique to individual customers, and thus may or may not require automation for cost effectiveness, depending on circumstance.

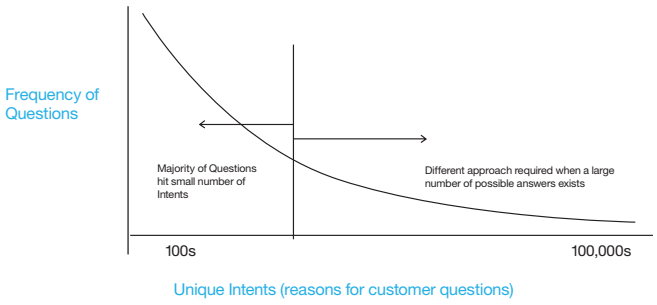


Figure 1: 80 percent of customer queries, represented on the left of the graph, are variations of the same small number of "intents"

Behind the Scenes

When Watson Engagement Advisor takes on a short-tail question, it applies a five-step process to resolve it. For example, a user might type, "I'm frustrated. I can't remember my online banking password" in a chat box on his or her tablet to Watson.

Here's how Watson gets to work resolving the customer's problem.

1: Watson Extracts Customer Intent
Watson has read documents comprising almost 500 million words to learn the subtleties of language, including idioms, syntax and ambiguities. It will also need to be trained on the domain specific information that relates to the area of business where you will put Watson to work. Drawing from this deep knowledge, Watson first identifies the intent behind the customer's question.

The question in our example could have been expressed in any one of thousands of different ways, including "I forgot my password;" "How do I reset my banking password?;" "I can't get into the system;" and "My login isn't working, please help." Given any of these variations, Watson is still able to identify the single underlying intent, which in this case is a request to "reset a password".

2: Watson Extracts Key Entities
Watson will have been trained on certain key entities relevant to the domain in question which allows it to next extract key entities to further narrow down its options for helping the customer.

At this point, Watson is confident that the intent behind the query above is "reset my password." However, it still needs to know what password the user means. Is it the customer's ATM password, online banking password or a credit card PIN?

Fortunately, there is more information in this particular query that can be used to better address the customer's need. Here, Watson determines from the customer's query that he or she needs to reset their password for online banking.

Alternatively, if the customer instead says something like, "I can't get into the system," without the entity, Watson can disambiguate the question by asking a question of its own, such as, "What system are you having trouble with—online banking, ATM access or credit card PIN?" to clarify the appropriate response to the customer.

Additional context can also be leveraged to better address the customer's query. For example, WEA can further refine its response based on whether the customer is using a mobile device, whether he or she is currently located near a branch, and whether she is a high-value customer.

3: Watson Extracts Emotional Tone
Watson then extracts the emotional tone of the query to understand whether the consumer is, for example, angry, frustrated or happy. This allows the system to express empathy in the conversation and tailor its responses appropriately. Here, the tone is fairly neutral, showing only a little frustration. Watson would respond differently if the user were obviously angry, which it could infer from the words and context used in the query.

4.Watson Extracts Context
Watson extracts context from the conversation to ensure that the conversation remains relevant. In this way, if the customer asks a question that is seemingly vague because it only makes full sense when considered in the context of their previous statements, Watson is still able to understand what is being communicated.

5: WEA Responds Appropriately

Finally, WEA combines its assessments of intent, entity, tone and context to make the right response. The system may take any number of different actions, depending on what is required. A text answer is only one. For example:

Question: What is my savings account monthly fee?
Text Response: "The monthly account fee for a savings account is $10.95."

Question: Someone has stolen my credit card.
Transfer: WEA transfers the chat to a human agent.

Question (sent as a voice command on a smartphone): I need to pay my credit card bill.
Application Navigation: WEA navigates to the Pay Bill screen on the customer's phone.

Question: Where is the nearest branch?
Branch Navigation: WEA launches a map with directions to the closest branch.

In our main example, Watson needs to provide more than a simple answer. In addition to responding with text (or voice), it also needs to invoke the right business process (the password reset process) and walk the customer through it. Watson can manage these tasks and more without transferring the customer to a different system or to a live agent.

Addressing long-tail questions

When Watson is not confident – when it has encountered an unusual question, one that would fall into the long-tail in our previously discussed distribution of questions and intents – it needs to take an appropriate action. There are two main ways to address the long-tail—the approximately 20 percent of unusual questions for which Watson does not have a confident answer. The most straightforward approach is to transfer these queries to a customer service representative. In this way, the number of customers deflected to the Contact Center is much reduced and the issues that they have to deal with should be the more complex ones that are more deserving of human attention.

But Watson can also take another approach, thanks to an Add On product to the core solution. This enables Watson to try to address a query that it has not seen before with a textual response it has found while searching in the documents that it has been trained on. Typically, Watson will be less confident in its answers in this instance and will return a number of possibilities for the user to select from. But this does give Watson a better chance of answering more queries appropriately on its own, without human intervention.

Watson Engagement Advisor goes far beyond the conventional call center automation mandate of controlling operational costs. It also empowers customers to serve themselves however and whenever suits them best. Wherever success or failure hinges on outstanding, affordable customer service, Watson presents a whole new world of opportunities.

For more information

For more on how IBM Watson Engagement Advisor is making a difference for organizations and their customers, visit **http://www.ibm.com/smarterplanet/us/en/ibmwatson/engagement_advisor.html**.

References

1 Ali Donaldson, "Millennials Ditch Big Banks and Go Local With Their Money," Bloomberg Business (http://www.bloomberg.com/news/articles/2015-11-10/millennials-do-not-like-big-banks-and-all-those-fees-they-charge)

Produced in the United States of America
January 2016

XXX00000-USEN-00