IDC PlanScape

IDC PlanScape: Conversational Artificial Intelligence

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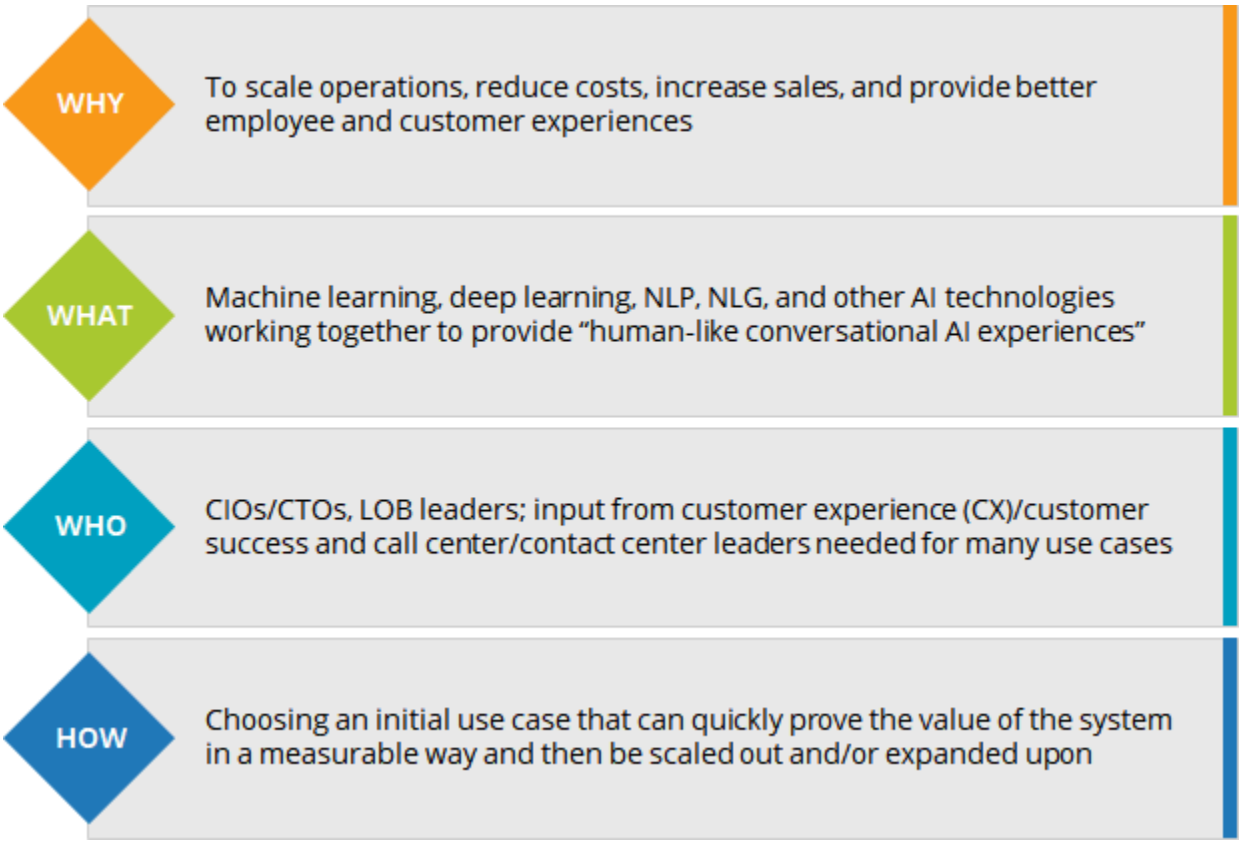
IDC PLANSCAPE FIGURE

FIGURE 1

IDC PlanScape: Executive Summary of Conversational Artificial Intelligence



Source: IDC, 2021

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EXECUTIVE SUMMARY

This IDC study provides business and technology leaders with a business case and plan for implementing conversational artificial intelligence (conversational AI or CAI) for their organization. It defines conversational AI and why it is a critical technology for businesses today, identifies key stakeholders, and walks readers through how to set up a project for success using several real-life examples.

"Recent improvements in various fields of AI, particularly those concerned with understanding and producing natural human language, have expanded the capabilities of what IDC considers second-generation conversational AI," said Hayley Sutherland, senior research analyst, Conversational Artificial Intelligence, IDC. "As digital and contactless experiences become more pervasive, organizations should consider employing this technology to scale operations, reduce costs, increase sales, and better understand their customers."

WHY IS CONVERSATIONAL ARTIFICIAL INTELLIGENCE IMPORTANT?

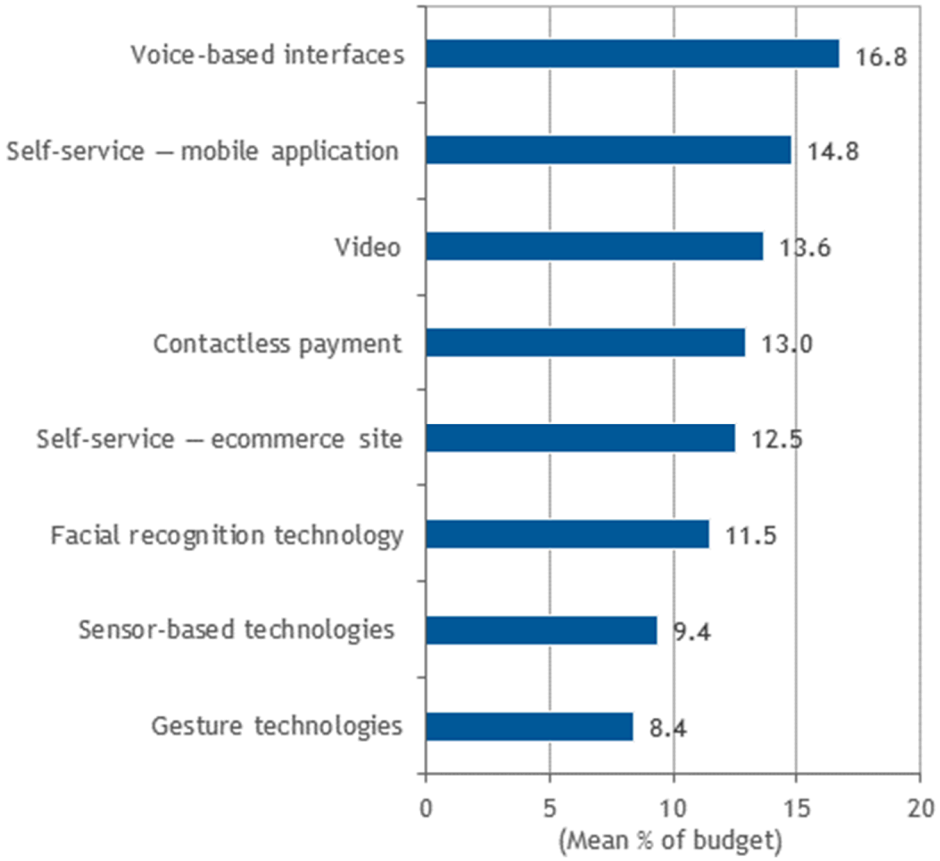
Over the past couple of years, conversational AI vendors have been taking advantage of significant improvements in AI, including machine learning (ML) and deep learning (DL), natural language understanding (NLU), natural language generation (NLG), and speech recognition (all defined in the What Is Conversational Artificial Intelligence? section), to make conversational AI systems more intelligent and usable than ever before. As a result, these systems are increasingly being used by organizations to scale their operations, improve customer satisfaction, and increase revenue. Conversational AI can now support a wide range of front-office and back-office functions, from providing digital coaching and question-answering to employees to mitigating contact center call volume to supporting customer experiences by providing alternative channels of communication. When sophisticated conversational AI systems are properly implemented and used in combination with the right set of analytics and automation capabilities, they are a powerful tool for helping organizations reduce costs, increase sales, and better understand their customers.

In 2020, the global shift to remote work and contactless experiences brought conversational AI into the spotlight, highlighting the need for enterprise organizations to leverage this technology to augment their existing capabilities and communication channels. While text-based conversational AI systems are still most common, IDC has noted the rise of voice-based conversational AI systems in the last year, including a number of applications rolled out in response to the COVID-19 pandemic. In IDC's *COVID-19 Impact on IT Spending Survey* (conducted September 2020), respondents across a variety of industries indicated that voice-based interfaces were the top planned investment area in support of contactless experiences for employees and customers (see Figure 2).

FIGURE 2

Investment Plans in Support of Contactless Experiences by Technology

Q. What percentage of the budget your organization plans to spend on achieving no-contact/contactless experiences will be allocated to the following technologies?



n = 572

Source: IDC's *COVID-19 Impact on IT Spending Survey,* September 2020

WHAT IS CONVERSATIONAL ARTIFICIAL INTELLIGENCE?

Conversational AI software/services are a subset of AI software that are specialized for the development of intelligent digital assistants and conversational chatbots. Conversational AI uses text and audio AI, information discovery, and other technologies (for more detail, see the bulleted list) to communicate with human beings. It can take different forms across a variety of user interaction channels, from a text-based chatbot to a voice-based virtual avatar, and exists on a spectrum of capabilities, from basic functionality to more sophisticated functionality. Some of the technologies that may be present in various conversational AI platforms are:

- **Keyword and phrase recognition:** This is the system's ability to recognize specific words (this is typically a training exercise for the organization).

- **Rules and scripting:** This is a highly orchestrated process flow based on behavior: "if they say x, do y." Most often, these rules and scripts are created and modified by humans, not machine learning models.
- **Voice and speech recognition:** This involves translation of spoken or typed phrases into text to prepare it for analysis. In the past, these were created by human programmers, but most voice and speech recognition systems today are machine learning or deep learning based.
- **Natural language processing (NLP):** This is the ability to extract people, places, and things (also known as entities) as well as actions and relationships (also known as intents) and even sentiment from sentences and passages of unstructured text. This area has also seen tremendous growth using machine learning/deep learning to build more sophisticated context-sensitive language models, such as the open source model BERT.
- **Natural language generation (NLG):** This is the ability to construct textual/conversational narratives from structured or semistructured data.
- **Affective computing (aka emotion AI):** This is a set of AI technologies that can detect and identify human emotions, behaviors, opinions, and cognitive states. This can be achieved by analyzing a variety of signals, including NLP-based sentiment analysis as well as speech, facial, biometric, and behavior analysis technologies. Increasingly, multimodal emotion analysis uses a combination of two or more of these technologies to analyze multiple signals together for greater accuracy and more nuanced understanding.
- **Knowledge graphs/knowledge bases:** For conversational AI applications to "understand" context, they need to have repositories of information about one or more subjects organized as entities or intents (see the "Natural language processing (NLP)" bullet point) linked together so that the application can find answers to questions or ambiguous references. Building these knowledge graphs/knowledge bases can require lots of effort and time for an organization but may be crucial to building a sophisticated conversational AI application depending on the domain.

First-generation CAI systems with only basic functionality typically perform better on a narrow list of task-oriented applications, such as a command to play music, initiate a phone call, or retrieve basic information, but struggle with more nuanced contextual dialogue, such as "What was our highest-performing product this quarter?" or "Can you give me an update on my legal case?" This limits their ability to be truly useful in business settings and often results in user frustration. Early experiences with these kinds of systems have made many business leaders leery of incorporating conversational AI into their organizations, anticipating frustrated customers and disappointing ROI.

However, recent improvements in various fields of artificial intelligence, particularly those concerned with understanding and producing natural human language, have expanded the capabilities of what IDC considers to be second-generation conversational AI. These systems are based on improved natural language processing and understanding, machine learning and/or deep learning, and the ability to build rich, contextually relevant knowledge bases that can answer general-purpose questions as well as support a wide range of actions and tasks. This in turn means that such systems can do a better job of natural language understanding (i.e., understanding the user's actual intent), handle multi-turn conversations, answer more nuanced requests, and provide useful predictions and recommendations, greatly enhancing their ability to provide digital assistance and even surface new contextual insights within the flow of work. Increasingly, IDC is also seeing conversational AI systems that can handle context switching, remember past utterances or statements, and even analyze user sentiment and provide empathetic responses, resulting in a more "humanlike experience" that most organizations are seeking for their employees and customers. These improvements are happening because of the significant advances in deep learning language models, many of which have been

promulgated as open source, such as Google's BERT model. These models are able to provide better contextual understanding of speech and sentence patterns and have paved the way for more accurate and lifelike conversational experiences when using conversational AI solutions.

WHO ARE THE KEY STAKEHOLDERS?

- **Executive sponsors (line of business [LOB], customer success, etc., depending on the industry/use case):** They secure initial funding and backing for the project.
- **CIO/CTO/information architect:** IT leaders validate the project, guide vendor selection, and may either guide or work with the vendor on IT implementation. Information architect leaders should be consulted when considering how to manage the additional data that will be created by the conversational AI system. Consider what systems conversational AI will need to interact with.
- **Line of business:** Line-of-business employees leverage the core applications and drive the need for development of enterprise use cases. For external-facing use cases, LOB employees may still serve as subject matter experts in terms of what the conversational AI system should "know."
- **Contact/call center:** Depending on the intended use of the conversational AI, the organization's contact center/call center is often a stakeholder.

HOW CAN MY ORGANIZATION TAKE ADVANTAGE OF CONVERSATIONAL ARTIFICAL INTELLIGENCE?

This section helps business and technology leaders understand how to set up a conversational AI project for success, using real-life examples. IDC conducted reviews and/or interviews of three technology buyer organizations that are leveraging Amelia, an IPsoft company, to create conversational AI applications, including text-based chatbots and voice-based digital assistants, for various front- and back-office functions:

- **Bankia,** a Spanish financial services company using Amelia to provide a conversational interface for its mobile application, automate customer-facing service interactions, and provide internal digital assistance and information retrieval
- **Kenneth S. Nugent, P.C. Attorneys at Law (Kenneth S. Nugent),** a fast-expanding United States–based law firm using Amelia as a digital legal assistant in both internal- and customer-facing situations
- **Telefónica,** a Spanish multinational telecommunications company using Amelia as an intelligent call center agent

While each of these companies operates in a different vertical and use cases for Amelia are varied, their stories share some common themes in terms of the selection process, ROI (including customer and employee reactions), and future planned uses of conversational AI. The learnings from their processes can — and should — be applied to any conversational AI project.

Selecting an Initial Use Case and Vendor

Critical to getting any AI project off the ground is choosing the right use case for a proof of concept (POC) or pilot. This should be a use case that can:

- Quickly prove value, in a measurable way that clearly aligns with business goals.
- Prove the performance of specific capabilities that will be critical to future planned use cases.

- Expose additional requirements regarding language support, user interaction channels, deployment options, and systems integration.

With an initial test case in mind, organizations can then begin to develop a requirement list for vendors.

Bankia

Bankia performed a proof of concept with three vendors using the same initial customer test case: blocking a bank card that had been misplaced or stolen. This is a common use case for this kind of financial digital assistance system, one that typically both is time sensitive and does not require human intervention. However, there were some complicating factors that made this an especially useful test case. Bankia knew that its customers typically do not remember their 20-digit card number, and as a result, if the card has gone missing, many use other attributes such as color to remember which card is linked to which account. This allowed Bankia to test not just the solution's ability to solve this specific problem but also its flexibility and capacity to learn (e.g., starting with the expectation that a user will leverage a number to identify their card, followed by the need to align with a color-based card identification). Bankia knew this would be critical in the future in terms of being able to add new intents and capabilities based on user feedback and emerging needs. "There were different levels of difficulty [in implementing conversational AI systems] we wanted to evaluate with the POC: How easy is it to broaden the scope? How do you add a new intent?" said Luis De Mena, director of Mobile within Bankia's Transformation and Strategy Division. "We knew that conversational AI was an interesting opportunity, but we didn't yet know exactly how our customers would use it, so these things were important for us to evaluate before we started the project."

Based on the intended test case and government regulations, the Bankia team was also able to identify additional vendor requirements such as:

- The ability to deploy in a private/on-premises cloud environment, combining the scalability advantages of cloud architecture with the security advantages of on-premises deployment
- The ability to handle a variety of use cases, including both text and voice channels within Bankia's mobile application as well as inbound customer calls (for customer-facing assistance) and internal calls (for internal information retrieval/digital assistance use cases).

Kenneth S. Nugent, P.C. Attorneys at Law

For Kenneth S. Nugent, P.C. Attorneys at Law, the appeal of an advanced conversational AI system was in the ability to scale its business without losing a personal, humanlike customer touch. The legal firm had previously decided that it would never implement IVR, believing that kind of an automated system to be too frustrating and robotic for customers. "All of our clients have a requirement of touch; they all want to be informed about their case," said Tim Derrickson, CTO of Kenneth S. Nugent. "So [conversational AI] was an opportunity for us to look at how we could automate certain aspects of our day and make jobs easier, give back time to our employees, and hopefully communicate better with our clients." Kenneth S. Nugent's team worked with the Amelia team to codevelop three use cases where conversational AI would have the most impact. The legal firm began by testing Amelia on its website to start, and then reviewed performance and user feedback before expanding to additional channels. Based on positive responses to the "humanlike performance" of the system, the Kenneth S. Nugent team decided to implement Amelia in additional emotionally sensitive use cases as well as expand to use in voice-based conversations.

As part of this process, the team also determined additional vendor requirements such as:

- The ability to provide a partner that could work closely with the vendor and Kenneth S. Nugent teams to integrate Amelia with existing knowledge bases and communication systems
- The ability to run the system in the vendor's cloud environment, both for ease of setup and to enable the vendor to handle maintenance and support

Telefónica

Similarly, though at a much larger scale than Kenneth S. Nugent, Telefónica was looking for a more modern approach to replace its legacy IVR system and interface with customers in a more personal fashion. "We discovered that the main catalyst for our digital transformation would be to focus on customer-facing processes," said Gonzalo Gómez Cid, director of Global Contact Center at Telefónica. "We wanted to be 24 x 7, anytime, anywhere, transparent, and personalized." The Telefónica team used this strategic goal as a North Star to guide vendor selection and the development of use cases.

Measuring ROI and Gauging User Responses

When measuring the success of a conversational AI project, it is critical to think beyond simple monetary ROI and consider how to measure the business value in terms of a range of aspects, including:

- The opportunity to provide consistent, educated dialogue with prospects and customers on a 24 x 7 basis
- The ability to provide that same dialogue via multiple channels ranging from text message and voice to social media platforms such as Facebook, Slack, Skype, and Twitter
- The opportunity to free up human customer service and sales resources to handle more difficult and challenging tasks
- The opportunity to improve employee job satisfaction
- The ability to reduce costs by leveraging this new technology
- The ability to improve overall customer service and retention
- The opportunity to provide new revenue streams by creating services that were not financially viable if supported by traditional call centers

Part of this process includes reviewing and gauging the response from both internal and external users. By reviewing user interactions with the conversational AI system, organizations can glean a wealth of knowledge not only on how the system is performing but also on how users are adapting to and feeling about the system, where there may be unexpected room for improvement, and what kinds of features and capabilities should be considered for future inclusion.

Bankia

For the Bankia team, user feedback was critical to understanding which intents and features should be included in the company's conversational AI systems. The initial rollout began with an internal instance of Amelia, which employees could use to answer questions and retrieve job-critical information; Bankia then surveyed its employees to understand whether they had found the tool to be helpful. User feedback was positive, to the extent that the Bankia team saw employees trying to use Amelia for additional capabilities that were not initially included. "Even if you put a tutorial at the beginning saying, 'Okay, here are the things you can ask Amelia,' it's funny how people start asking for more and more things once they start using the system — even employees," De Mena notes.

Based on this lesson, Bankia relied on user feedback to determine most of the capabilities for the customer-facing mobile application instance of Amelia. "At the beginning, we had a list of probably 20–25 [capabilities] to be added in a second phase," said De Mena. "Out of those 25, only 5 are within the 10 that we actually added — but then there are another 5 that we have implemented based on the customer feedback, things that we never had in our initial list of 20–25 to be done." By keeping the initial feature set relatively small and relying on its users to indicate what else they wanted from the system, Bankia believes it saved significant time and money on the implementation process.

For Bankia, there was immediately visible ROI in the form of calls handled by the conversational AI system, which it named "Bianka," instead of by an agent in the contact center. The chosen test case — unblocking the pin of a blocked bank card — was a primary driver of inbound customer calls, and when fully implemented in Bankia's call center, the result was "dramatic," according to De Mena. "The return on investment with just this was clear." Bankia also regularly gauges user responses to the system via a "Did I help you?" button soliciting feedback, supplementing with small focus groups to understand potential areas for improvement.

Kenneth S. Nugent, P.C. Attorneys at Law

Upon examining transcripts to gauge how customers felt about the new system, the Kenneth S. Nugent team was pleasantly surprised. "A lot of people think she's a person, but I'm not really reading frustration in the transcripts," Derrickson notes. He attributes this to a few specific capabilities, including the immediate transfer to a human the moment the system does not understand something (as opposed to asking the user to repeat themselves ad nauseam), the ability to understand natural language and handle nonstandard requests (including recognizing when a caller has a need that the firm cannot handle and directing them to the appropriate resource), and the ability to analyze user sentiment and add a personal touch (e.g., saying "I'm sorry to hear that" when a customer is calling to report an accident). These represent some of the second-generation conversational AI features (such as contextual understanding, advanced NLP, and emotion AI), detailed previously, that can help provide a more humanlike experience for users of conversational AI systems.

For Kenneth S. Nugent, the ROI on this conversational AI solution comes in multiple forms. For one, Amelia now handles around 75% of the firm's 40,000 monthly website interactions and 20,000 incoming calls from end to end. "We could probably do away with at least three operators, but we're not going to do that," said Derrickson. Instead, Amelia will be used to free up time for all of Kenneth S. Nugent's operators to perform other work, increasing both employee productivity and employee satisfaction: "It's like giving a personal assistant to each of our case managers, so they can spend more time connecting with our clients and building winning cases." Derrickson says the firm has also seen a significant increase in four- and five-star Google reviews since implementing the system. Finally, looking at more traditional notions of ROI, the legal firm estimates that $250,000 in initial savings has been generated by Amelia in 2020, and an additional $120,000 in annual savings is expected from layering Amelia into after-hours system. Amelia was also responsible for 111 of the cases the firm signed in September 2020 and has earned roughly $500,000 in new business that might not otherwise have been attained.

Telefónica

For Telefónica, based on its initial goals for a conversational AI system, the first metric for success was the ability to expand customer service to 24 x 7 x 365 availability, with Amelia replacing its IVR system and handling 4.5 million calls per month. The next question, of course, is, how well the system is performing on these millions of customer service calls. Telefónica used two metrics to measure this: First, did Amelia understand what the customer was looking for? The company found that 90.2% of the

time Amelia was correctly recognizing customer intent. A second, even stronger indicator of customer satisfaction with the system was the significant decrease in customer abandonment rates on these calls, which dropped by 44%.

Scaling Out and Looking Ahead

A conversational AI system can be a significant investment in time, money, and (if managing in-house) employee resources. This makes it important to consider not only the initial, more time-sensitive use cases but also how the system can be scaled out and applied to other use cases in the future. With voice-based interfaces as the top planned investment area in support of contactless experiences, it is beneficial for any organization considering conversational AI to think about future uses of conversational AI across multiple channels and to begin to develop strategies around voice and video channels if they are not already in place.

For example, Telefónica is training Amelia to take on additional customer service roles. Similarly, Kenneth S. Nugent, P.C. Attorneys at Law plans to use Amelia to generate letters and email messages to concerned parties, further supporting the case management team. The firm also intends for Amelia to make outbound calls to clients, which it estimates will save an average of 60,000–75,000 hours per year — the equivalent of a full year's worth of work hours for 28–33 employees. Another potential future use for the system is as a virtual avatar of Ken Nugent, the legal firm's founder, to greet visitors to the firm's social media pages. "Can you imagine, you come to our Facebook page and you actually see Ken, speaking to you in his native New York tongue?" says Derrickson.

The possibilities for conversational AI are manifold, and by working with vendors, partners, internal teams, and even customer focus groups, organizations can continue to find new ways to leverage this technology to achieve their business goals.

ADVICE FOR TECHNOLOGY BUYERS

For both employee- and customer-facing use cases, conversational AI systems are a critical piece of digitizing and scaling out business operations, enabling greater self-service and increasing touch points. IDC offers the following advice to organizations considering implementing a conversational AI system:

- When selecting a vendor, consider not only the conversational AI software vendor itself but also the partners that will work with you to ensure the solution functions as intended, including integration with organizational knowledge bases.
- Consider how to manage the additional data that will be generated by conversational AI systems, whether text, voice, or even video. "Now that the volume is growing and growing, it's a little bit challenging now to manage, so we are thinking about next steps in terms of how to automate this a little bit more," says Luis De Mena of Bankia.
- Do not neglect the empathy aspect; given the choice, employees and customers will not work with a system that frustrates them or makes them uncomfortable. In many cases, successfully deflecting calls from human agents while maintaining or even increasing customer satisfaction requires a conversational AI system that can provide a personal, humanlike touch.
- Make conversational AI an integral part of companywide transformation. Tim Derrickson of Kenneth S. Nugent advises, "You have to embrace [conversational AI] in the whole company culture, because it's a big investment and it takes time to build it and to keep it going and support it. You have to get everybody on board, and you have to make it part of your environment."

RELATED RESEARCH

- *IDC Market Glance: Conversational Artificial Intelligence* (forthcoming)
- *IDC MarketScape: Conversational Artificial Intelligence* (forthcoming)
- *How Important Are Voice-Based Interfaces for Contactless Experiences in the Era of COVID-19?* (IDC #US46855320, September 2020)
- *Conversational AI in the Era of COVID-19* (IDC #US46212119, April 2020)
- *IDC Innovators: Conversational AI Software Platforms, 2018* (IDC #US44001917, June 2018)

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