



A DELOITTE SERIES ON CONVERSATIONAL AI

Conversation starters

Conversational AI makes its business case

Vatamaja, Sherry Comes, and Timothy Murphy

THE DELOITTE CENTER FOR INTEGRATED RESEARCH

The age of conversational AI is here, altering the landscape of traditional Web and mobile applications. What factors are enabling the success of these systems and what benefits could they offer your enterprise?

THE GRAPHICAL USER interface and mouse propelled the personal computer into the hands of nontechnical consumers with its user-friendly design. Smartphones and tablets flooded the market with easy-to-navigate apps, controlled not by a keyboard and mouse, but by the swipe of a finger, making intuitive interfaces commonplace. Whether it's a mouse or a finger, each iteration succeeded by aligning technology to our more human instincts. And what's more human than having a conversation?

Enter the era of conversational systems. These systems, more commonly referred to as conversational AI (artificial intelligence), combine natural language processing, AI, and machine learning to understand and respond to free-form text or voice—in an engaging and personalized manner.

With increased access to cloud computing and sophisticated algorithms, more companies can implement conversational AI solutions that can turn technology adoption into a conversation rather than an exercise in mastering a user interface. Many expect conversational AI to therefore alter the landscape of traditional Web and mobile applications—first by augmenting them and then, at their finest, by displacing them.

The appeal of conversational AI isn't going unnoticed. Across nearly every industry, conversational systems can be found in our homes, cars, call centers, banks, and hospitals—and the use cases are growing. By one estimate, the global conversational AI market is expected to grow from US\$4.2 billion in 2019 to US\$15.7 billion by 2024 (with a 30.2 percent compound annual growth rate).¹



Across nearly every industry, conversational systems can be found in our homes, cars, call centers, banks, and hospitals—and the use cases are growing.

Two key technology trends seem to be making this growth possible:

- The proliferation of messaging platforms (for example, WeChat) create myriad opportunities for businesses to interact with people through well-designed chatbots. Messaging platforms are becoming so intertwined in our lives that the four largest messaging platforms have more active users than the four largest social media platforms (4.1 billion versus 3.4 billion).²
- The commoditization of speech-based assistants, such as Google Home and Amazon Alexa, paves the way for companies to develop their own speech-based assistants and/or affordably overlay others' conversational systems onto their platforms.

In the first of our five-part series on conversational AI (see the sidebar, “A five-part series on conversational AI”), we explore how these systems can enhance customer engagement, workforce operations, and business partner integrations.

Three reasons to integrate conversational AI into your enterprise

Though conversational AI has existed for over a decade, the use cases and applications continue to become more sophisticated and gain traction in a variety of areas. Further, as computing costs continue to decrease while capabilities expand, personalization at scale has likely never been more attainable. Below, we discuss three areas where conversational AI can flourish:



INTEGRATING THE USER EXPERIENCE

There are over 26 billion smart devices in circulation across the world.³ Embedded with Internet of

A FIVE-PART SERIES ON CONVERSATIONAL AI

Over the next year, we will discuss the implications and use cases of conversational AI. Beginning with our first chapter on the business case for conversational AI, we integrate secondary research and a series of case studies to navigate the following four topics:

Acoustic authentication: Explains how conversational systems can enhance security protocols by integrating voice into the multiauthentication process

The three Ts of conversational systems: Dives into how one can effectively build conversational AI through Training, Tuning, and Testing

Industry use cases: Highlights how virtual assistants appear to be changing the face of customer service in banking, technology, and health care

The liability of conversational systems: Explores how the more we integrate conversational bots into our work and lives, the more we should take steps to understand their liability in terms of insurance, training, auditing, and the ethical implications

Things (IoT) sensors, their power lies in their connected nature. However, toggling from one app to another to control any variety of devices can make the experience feel disjointed. In response, voice assistants are becoming the new interface for interacting across applications and devices—eliminating the need to ever directly access any individual enterprise’s application.⁴ Many of us already use home assistants to help us play music, listen to a weather report, and dim our smart lights, but this could be just the beginning. For instance, Pillo, an in-home health care technology provider, is deploying voice assistants to manage patient health. Powered by a voice interface, Pillo uses machine learning, facial recognition, and video conferencing to offer services compliant with the Health Insurance Portability and Accountability Act (HIPAA). These services can be paired with smartphones and wearables to administer medications, answer medical questions, and facilitate video conference appointments with health care professionals.⁵



OPTIMIZING THE REPETITIVE, WITH A PERSONAL TOUCH

From e-commerce sites to self-service kiosks to call centers and help desks, people commonly engage with these resources to tackle any number of repetitive tasks. It can range from a regularly replenished micro sale of things such as detergents and lawn fertilizers, to seeking answers and support to frequently asked questions. While robotic process automation (RPA) and one-touch ordering buttons are already transforming many of these tasks, they don’t always provide the most customer or worker-centric experience. However, finely tuned conversational systems can. In fact, younger generations seem to be gravitating toward accessing information through chatbots, with 70 percent of millennials reporting a positive experience after using them.⁶



INNOVATING THROUGH CONVERSATION

Conversational systems are, by nature, an unstructured way of communicating. This means every session provides an opportunity to gather more information for algorithmic improvement and creating relevant product solutions that better align to the user’s objectives. In addition, conversational systems are continually being redeployed to solve new business issues. For instance, the automotive industry is piloting the use of voice biometrics to unlock personal information such as navigation history and recent phone calls.⁷

Building conversational AI for your organization

While opportunities abound for conversational AI, it’s not a panacea either. Instead, implementations could benefit from considering these three dimensions:

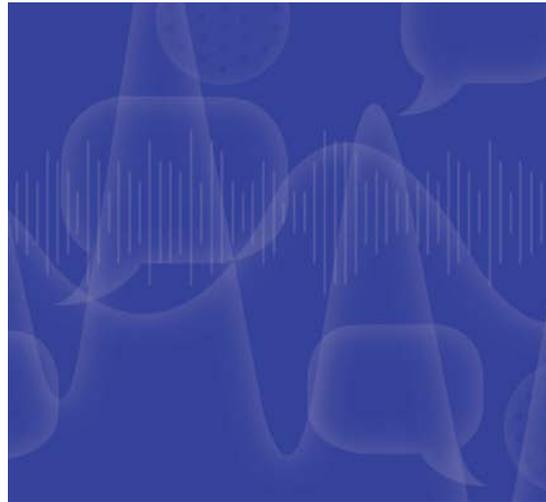
- **Align the goal to the need:** Data sets, though expanding every day, are still finite. In this sense, consider starting with well-defined goals for your conversational systems and avoid one-size-fits-all solutions. In fact, many of these systems perform best under strict guidelines. Expecting a customer service chatbot for an online grocer probably isn’t best suited (or necessary) for providing stock portfolio advice.
- **Remember the human:** By nature, AI solutions are “smart” in a narrow sense.⁸ That is, they are very good at solving specific problems but still fail considerably at more human tasks such as critical thinking and empathy. Focusing on the need at hand, conversational AI can solve repetitive tasks in a more human-centric manner. However, a health care benefits chatbot, for instance, would probably not be the most qualified “person” to give a sensitive

message denying benefits. In these cases, human understanding and intuition cannot be replicated.

- **Put ethics at the forefront of your conversations:** It's hard to discuss AI without thinking of the ethical implications. And as mimicking human conversation only improves, the issue is only amplified. Designers of conversational systems can best serve their stakeholders by being transparent about the fact that they are interacting with a conversational system. Further, designers should consider workforce displacement and how they can implement conversational AI while still providing opportunities for their employees to grow in their careers.⁹

Indeed, these systems are at the cusp of potentially changing the way humans interact with machines.

As we continue on the conversational AI journey, more advanced applications, use cases, and paradigms will likely evolve, resulting in enhanced productivity for businesses and more personalized and accessible experiences for end-users.



Endnotes

1. MarketsandMarkets, *Conversational AI market by component (platform and services), type (IVA and chatbots), technology, application (customer support, personal assistant, and customer engagement and retention), deployment mode, vertical, and region—Global forecast to 2024*, accessed August 28, 2019.
2. Travis Montaque, "Here's how messaging is positioned to dominate in 2019," *Adweek*, January 3, 2019.
3. Statista, "Internet of Things (IoT) connected devices installed base worldwide from 2015 to 2025 (in billions)," November 27, 2016.
4. Phil Wainwright, "Off with their heads! A conversational revolution in enterprise apps," *diginomica*, September 3, 2017.
5. Pragati Verma, "Why voice assistants are gaining traction in healthcare," *Samsung NEXT*, March 29, 2018.
6. WotNot, "Chatbots and millennials—A match made in heaven?," *The Startup*, November 28, 2018.
7. Nuance, "Voice biometrics—The key to deeply personalized in-vehicle speech," accessed August 6, 2019.
8. Jim Guszczka, "Smarter together: Why artificial intelligence needs human-centered design," *Deloitte Review 22*, January 22, 2018.
9. David Schatsky et al., *Can AI be ethical?: Why enterprises shouldn't wait for AI regulation*, *Deloitte Insights*, April 17, 2019.

Acknowledgments

The authors would like to thank **Scott Pobiner** of Deloitte Consulting LLP for his contributions to this series.

About the authors

Vatatmaja | vatatmaja@deloitte.com

Vatatmaja is a specialist leader in Deloitte's Applied AI group. He is a quintessential IT professional, focused on cognitive computing, AI, deep learning, and emerging technologies, applying that knowledge to find interesting business solutions that improve productivity measures. He has frequently synthesized and recognized abstract patterns, facts, theories, trends, inferences, relationships, key issues, and themes in complex and variable unrelated situations, while solving client business problems.

Sherry Comes | scomes@deloitte.com

Sherry Comes is a managing director at Deloitte, in the Applied AI group. She specializes in the areas of voice solutions, AI, natural language processing, sentiment analysis, analytics, data science, and machine learning. Her innovative approach has won her innovation awards, and has helped her lead, and be an integral part of, many ground-breaking advancements, such as being the first person to bring AI solutions to Africa as a Distinguished Engineer at IBM Watson. She has done extensive work around creating voice virtual assistants in financial services and has also received a number of patents.

Timothy Murphy | timurphy@deloitte.com

Timothy Murphy is a researcher and analytical scientist at Deloitte Services LP, developing thought leadership for Deloitte's Center for Integrated Research. His research focuses on the managerial implications of the behavioral sciences within the workforce and the marketplace.

Contact us

Our insights can help you take advantage of change. If you're looking for fresh ideas to address your challenges, we should talk.

Practice leadership

Sherry Comes

Managing director | Deloitte Consulting LLP | Applied AI practice—conversational AI leader
+ 1 720 325 3757 | scomes@deloitte.com

Sherry Comes is a managing director at Deloitte, in the Applied AI group. She specializes in the areas of voice solutions, AI, natural language processing, sentiment analysis, analytics, data science, and machine learning.

Vatatmaja

Specialist leader, analytics and cognitive | Deloitte Consulting LLP
+ 1 234 567 8910 | vatatmaja@deloitte.com

Vatatmaja is a specialist leader in Deloitte's Applied AI group. He is a quintessential IT professional, focused on cognitive computing, AI, deep learning, and emerging technologies, applying the knowledge to find interesting business solutions that improve productivity measures.

Center for Integrated Research

Timothy Murphy

Senior manager | Center for Integrated Research | Deloitte Services LP
+ 1 414 977 2252 | timurphy@deloitte.com

Timothy Murphy is a researcher and analytical scientist at Deloitte Services LP, developing thought leadership for Deloitte's Center for Integrated Research. His research focuses on the managerial implications of the behavioral sciences within the workforce and the marketplace.

About the Deloitte Center for Integrated Research

The Deloitte Center for Integrated Research focuses on developing fresh perspectives on critical business issues that cut across industries and functions, from the rapid change of emerging technologies to the consistent factor of human behavior. We look at transformative topics in new ways, delivering new thinking in a variety of formats, such as research articles, short videos, in-person workshops, and online courses.

Deloitte.

Insights

Sign up for Deloitte Insights updates at www.deloitte.com/insights.

 Follow @DeloitteInsight

Deloitte Insights contributors

Editorial: Rithu Thomas, Nairita Gangopadhyay, Preetha Devan, and

Anya George Tharakan

Creative: Sonya Vasiliieff

Promotion: Ankana Chakraborty

Cover artwork: Neil Webb

About Deloitte Insights

Deloitte Insights publishes original articles, reports and periodicals that provide insights for businesses, the public sector and NGOs. Our goal is to draw upon research and experience from throughout our professional services organization, and that of coauthors in academia and business, to advance the conversation on a broad spectrum of topics of interest to executives and government leaders.

Deloitte Insights is an imprint of Deloitte Development LLC.

About this publication

This publication contains general information only, and none of Deloitte Touche Tohmatsu Limited, its member firms, or its and their affiliates are, by means of this publication, rendering accounting, business, financial, investment, legal, tax, or other professional advice or services. This publication is not a substitute for such professional advice or services, nor should it be used as a basis for any decision or action that may affect your finances or your business. Before making any decision or taking any action that may affect your finances or your business, you should consult a qualified professional adviser.

None of Deloitte Touche Tohmatsu Limited, its member firms, or its and their respective affiliates shall be responsible for any loss whatsoever sustained by any person who relies on this publication.

About Deloitte

Deloitte refers to one or more of Deloitte Touche Tohmatsu Limited, a UK private company limited by guarantee ("DTTL"), its network of member firms, and their related entities. DTTL and each of its member firms are legally separate and independent entities. DTTL (also referred to as "Deloitte Global") does not provide services to clients. In the United States, Deloitte refers to one or more of the US member firms of DTTL, their related entities that operate using the "Deloitte" name in the United States and their respective affiliates. Certain services may not be available to attest clients under the rules and regulations of public accounting. Please see www.deloitte.com/about to learn more about our global network of member firms.