



POINT OF VIEW | APPLICATION SERVICES

# What to Consider When Considering Voice Assistants

## Five best practices for implementing this AI-driven technology

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# Executive summary

1

## Be concise

Target use cases that provide information to help your users make decisions quickly.

2

## Adopt a flexible approach

Accommodate various types of dialogue to support the most natural interactions possible for different users.

3

## Interact securely

Put security at the forefront of your design process for consumer interactions that involve voice assistants.

4

## Keep the conversation flowing

Adopt natural speech patterns to streamline interactions.

5

## Remember that personal touch

Personalize interactions to help validate the context and support a more efficient experience.

## The 5 best practices we implemented

It seems that everyone is talking about voice assistants and what they can offer in today's business model. And with 86% of virtual yay-sayers indicating that they're "comfortable speaking with a virtual agent," it's no wonder this innovative technology is gaining ground.<sup>1</sup>

Voice assistants enable companies of all types to provide solutions that help their customers and employees alike quickly and easily achieve their goals.

Recently, NTT DATA worked with a leading independent mortgage lender on an Alexa skill design and development project.

Read on to learn more about what you should consider when incorporating voice assistants into your business.



# Rise of the voice assistants

Voice assistants are creating a buzz reminiscent of the rise of smartphones a decade ago. This emerging technology is a type of hands-free software service driven by artificial intelligence (AI) that supports interactions using natural language voice commands. Voice assistant solutions can be built into a variety of devices, such as smart speakers, smartphones, computers, automobiles, appliances and internet of things (IoT) products, and utilized in nearly any environment to expose functionality in new ways and interaction types. The primary platforms currently available include Amazon's Alexa, the Google Assistant, Apple's Siri, Microsoft's Cortana and Samsung's Bixby. These platforms, and the new interaction types they support, enable companies to provide solutions that can help customers and employees achieve their goals more quickly and easily. Based on research conducted by NTT DATA Services, there is an emerging group of "virtual yay-sayers" who are open to using technology to complete their tasks more efficiently. In fact, 74% of these yay-sayers state that they "love using Siri or Alexa." This group accounts for a small but growing constituent of consumers who prefer to interact with businesses through voice assistants and, as such, are the "most important segment for businesses to pay attention to" when considering automation solutions.<sup>1</sup>



So, how can your business best prepare to accommodate this growing population? And what should you consider when making the decision about the scope of voice assistants within your business model?

NTT DATA recently completed an Alexa skill design and development project for a leading independent mortgage lender — referenced throughout with the pseudonym "My Mortgage Skill." Here are five best practices we followed for successfully implementing this AI-driven technology. (Note: Although the concepts discussed here generally apply to all platforms, for consistency we'll reference only Amazon's Alexa platform, particularly referring to solution instances as "skills.")



Figure 1: A segment of consumers is comfortable with automation, and it's likely to grow

# Five best practices for successfully implementing AI-driven technology

## 1. Be concise

According to our study on the use of voice assistants, consumers are more likely to use a voice assistant device when the interaction is quick and simple, whereas they prefer to speak to a live agent when their questions are more complex.<sup>1</sup> If your organization is looking to build solutions with voice assistants, target use cases that provide information to help your users make decisions quickly. Users should be able to speak their requests intuitively, and responses should avoid both verbose feedback and back-and-forth interactions to obtain additional details. This need for quick, succinct interactions may result in requests being broken up into smaller chunks. Information that may be grouped together within a single interface on the web or a mobile app may need to be delivered through discrete interactions within a voice assistant so that just one particular data element is obtained at a time.

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The same study found that consumers still value the accuracy of a response over speed and convenience. NTT DATA's recognition of and support for these consumer preferences are evident in the My Mortgage Skill project we recently developed to support very concise use cases that provide details about loan applications. We structured the skill to respond accurately with the desired information in only one statement. Additionally, we utilized features of the Amazon Alexa Dialog Model to obtain the criteria necessary to avoid further prompting. When the result set is reduced to no more than three items, those items are listed for the user to choose from. This model not only presents the best opportunity to fulfill the request entirely, but also provides a simple interaction pattern for obtaining additional information and limits the amount of response required when the user must select from a list.

## 2. Adopt a flexible approach

When deciding how to structure functionality for voice assistants, you need to consider the particular scenarios your users may be in (are they multitasking in an office, driving in a car or preparing for a trip?) when they're looking to obtain information, as well as the specific data points they'll want while in those situations, because this knowledge will guide the types of requests you need to support. As an example, NTT DATA's My Mortgage Skill project included a simple use case to obtain the status of a loan application. Although this task may be overwhelming for functionality in a web or mobile application, it can be used by loan officers to quickly and easily identify loan applications that require urgent action while they're doing other work or even driving — through the use of voice assistant-enabled hands-free devices available for cars.

One of the key features of voice assistants is their support of natural language processing, which means they need to be able to accept requests spoken in the variety of ways humans instinctively speak. Some people may want to interact with voice assistants by providing all the required details of the request in one shot, whereas others may prefer to have their assistant prompt them for the required details. Users can even initiate a skill in various ways; for example, they can ask to do something directly within the initial request, or they can “open” the skill first and then specify what they want.

For direct invocation requests, additional details can be incorporated to support a more natural interaction. The mortgage skill NTT DATA developed highlights this capability, where the skill enables the user to make a request such as, “Alexa, ask My Mortgage Skill for the status of the Johnson application.” In this case, the invocation provides the information necessary to completely fulfill the request (skill name, type of request and name associated with the request). Of course, the user could have conducted the same interaction as a multistep process — as shown in Figure 2 — so building the solution to accommodate various types of dialogue allows the skill to support use cases in the most natural way possible for the user.



Figure 2: Multistep interaction example

### 3. Interact securely

In the current business and technology climate, security is of the highest priority. Particularly in the financial services industry, with its substantial operational risk factors, you need to consider security measures carefully. An NTT DATA study found that “virtual assistants are the future method for consumers to interact with FSIs (financial services institutions),” so organizations need to put security at the forefront of their design process for consumer interactions that involve voice assistants.<sup>2</sup> Use cases involving voice assistants often have unique security considerations due to the exposed nature of the interactions (that is, requests spoken aloud).

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platform, there may be support for multiple accounts associated with the device, each of which is differentiated by a vocal pattern, or there may be a single account shared by multiple users, regardless of who those users are. The account linkage is typically established via configuration online or through a platform-specific mobile app, and it involves some degree of authentication to verify the identity of the user. However, once the account is linked, it's generally available to anyone using the device. Depending on the interactions supported, this may not provide adequate security.

Another option for securing your voice assistant interactions includes multifactor authentication, typically via a mobile device within the user's reach. This authentication could be initiated through a link that's texted or delivered to the user

It's difficult to support users who provide a password when they're speaking into a device with others potentially within earshot. The initial means of securing any voice-based skill is through an account linking mechanism that enables a user to preconfigure an account(s) associated with the device. Depending on the

as a mobile app notification. The link points to a website or mobile app where users provide login credentials to authenticate themselves. During this process, the skill would pause the interaction and wait for the authentication process to complete before proceeding. Upon completion, the skill would receive notice of a successful authentication and resume the interaction.

Alternatively, you can either send the user a one-time code or have the user set up a permanent code via a mobile app. Upon receipt of that code, the user must speak it into the device to authenticate. Speaking a pin code should only be used with interactions that involve less risk and/or in scenarios where the user is known to be in an isolated environment, such as a closed-door office or a sound-proof booth. Additionally, a session can be maintained for a limited duration to eliminate the need for users to repeat their pin code for every request.

## 4. Keep the conversation flowing

In keeping with the natural flow of speech-based interactions, you need to ensure that details given by the user throughout the entirety of a dialogue are retained and used as necessary. Users shouldn't have to repeat information they've already given when additional interactions are required. Such behavior can be expected when a user needs to authenticate within the context of an interaction. In this scenario, the user may have already made a request and provided relevant information pertaining to that request but may have not yet been authenticated.

In our recent My Mortgage Skill voice-assistant project, the requirements included users speaking a four-digit pin code in order to authenticate when using certain interactions of the skill. To keep the interactions succinct, our team devised a solution in which the skill prompts users for their pin code while the session retains the initial details of their request. If the user hasn't yet been authenticated, the skill prompts the user for the pin code. Once it's provided, the original request processes seamlessly. This mechanism also enables users to provide their pin code within the initial request itself, so the additional prompt to authenticate isn't needed. Your ability to support various styles of input increases the versatility of a voice assistant and its applicability to a broader audience.

## 5. Remember that personal touch

A primary feature of voice assistants and other AI-related platforms is support for interactions that emulate the natural dialogue of humans. One key factor in these interactions is for the conversation to include some elements of personalization. A personalized experience can instill more confidence in the capabilities of a voice assistant, help validate the context and support a more efficient experience.

Just as companies use a personalized salutation in emails to convey to their consumers that the communication is authentic, voice assistants can respond to the requestor by name so the context is set and there's no ambiguity as to the subject of the interaction. You can make the identification of the requestor known to the voice assistant through a few different mechanisms, such as the initial account linkage process, security credentials provided by the requestor or a voice pattern match capability that some AI platforms support. Our recent My Mortgage Skill project involved the creation of an Alexa skill utilizing the account linkage option to identify the requestor and welcome that user by name with its initial response. Additionally, the scope of data was paired down based on the requestor's identity to ensure search requests were minimized and responses were tailored to that requestor, providing a more efficient experience.

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# Looking toward the future

The rise in popularity of voice assistants affords new opportunities for your organization to interact with your customers and employees. The buzz and excitement around this new technology also helps showcase the companies that have voice assistant skills as innovators and pioneers in their field. The hands-free and ubiquitous nature of the devices (always on and available throughout multiple rooms in a household or office) means your company can take advantage of the unique nature of particular environments and contexts. However, you need to be aware of the expectations your users have within those environments and contexts, and to deploy solutions that provide them with intuitive and seamless experiences. Incorporating the best practices described in this paper will help you create solutions that support these goals.

## About the author

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John directs technology innovation at NTT DATA's Collaboration Center in Plano, TX. He has over two decades of experience in software solution architecture and implementation, with a primary focus on mobile, web and IoT. His responsibilities include identifying and managing innovations within the Collaboration Center, and supporting client engagements involving emerging technologies. John has also spearheaded multiple R&D initiatives at NTT DATA, helping drive the direction of IoT, wearable computing, mobile and web capabilities within the organization.

## Source

<sup>1</sup> Fitzgerald, Kris. "Clearing the Customer Service Hurdle in an Automated World." NTT DATA Services. April 2018. <http://go.pardot.com/l/60932/2018-01-31/fmj3qt>

<sup>2</sup> NTT DATA Services. "NTT DATA study finds Alexa and Siri will drive the digital customer experience of the future for financial services firms." Press release. December 5, 2017. [https://us.nttdata.com/en/news/press-release/2017-december/ntt-data-study-finds-alexa-and-siri?utm\\_content=bufferfcf02&utm\\_medium=social&utm\\_source=twitter.com&utm\\_campaign=buffer](https://us.nttdata.com/en/news/press-release/2017-december/ntt-data-study-finds-alexa-and-siri?utm_content=bufferfcf02&utm_medium=social&utm_source=twitter.com&utm_campaign=buffer)

## Let's get started

You can get a demonstration of our voice assistant capabilities first-hand at the Collaboration Center in our Plano, TX, headquarters. Our state-of-the-art Collaboration Center will spark your curiosity, broaden your view and help you solve complex business challenges. Check out our [website](#) to learn more and schedule a visit today.

Visit [nttdataservices.com](#) to learn more.

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