

**J.D. POWER**

GLOBAL BUSINESS INTELLIGENCE

## **Voice Services in Vehicles**

A deciding factor in the customer purchase decision



Voice is nearing a tipping point. The concept has been around for decades, but until fairly recently, its promise was largely unfulfilled – due in large part to technology limitations. That’s changing. The last decade has seen great advancements in cloud computing, machine learning and natural language understanding. And these advancements are creating a path for computing technology that can process tens of millions of words, allowing voice services to understand context and conversation in a way that was never before possible.

Thanks to these advances in computing power, voice technology has begun to change the way we interact with technology. With a simple, natural command, people of all ages can easily complete everyday tasks, from playing music and checking the news to controlling smart home devices and keeping in touch with friends and family. But those advances are expensive and incredibly challenging to deliver – especially in noisy, active environments like the kitchen or living room. Amazon has solved this particular challenge by utilizing their AWS cloud, where there is enough horsepower to really make voice work.

Voice technology has proven particularly useful in environments where consumers are preoccupied with other things and need a natural, intuitive way to complete tasks or get information. Voice-first technology is also the most natural and intuitive way to interact with technology because it does not require the user to learn new visual interfaces. Home usage has seen incredible growth over the last few years, and as more companies look to extend that voice-first experience to other environments, the car is quickly emerging as the next great opportunity for voice to improve consumers’ lives in a meaningful way. Amazon and J.D. Power recently completed a survey to better understand consumers’ experiences, expectations, and desires for voice in the car in the 2018 J.D. Power/Alexa Automotive –In-Vehicle Voice Connectivity Study.

## METHODOLOGY

The study focused on consumers who own (1) a vehicle produced in the last five years and (2) a voice-enabled device<sup>1</sup> like the Amazon Echo. All brands of voice services and devices were included. The study was conducted in July 2018 in the United States and had over 5,000 responses in total.

- Survey of 2014-2018 MY vehicle owners who own a voice-enabled device
- U.S. focused
- Online panel survey
- Survey Field Period: July 2018
- Results: 5,010 surveys completed

<sup>1</sup> Respondents were qualified through ownership of an in-home voice-enabled device such as an Amazon Echo, Google Home, Apple HomePod, etc.

The study was designed to understand the consumer perspective around extending voice services to the vehicle environment.

## BACKGROUND

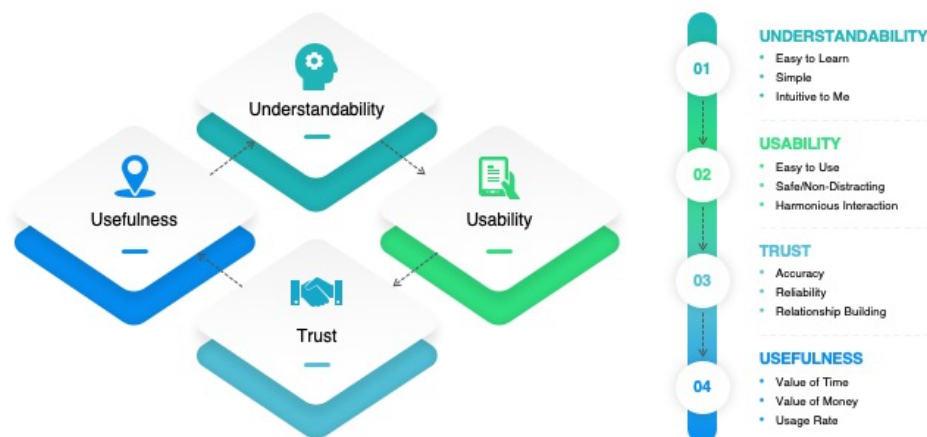
User experience is the next battleground in the consumer’s definition of quality. Time and time again, J.D. Power has witnessed cases where a product performs exactly how the engineers intended, but fails to satisfy consumers who find it unintuitive or difficult to operate. This is the softer side of product design where there is a broad range to the definition of intuitiveness.

To help define the elements of what creates a good user experience, J.D. Power created a model composed of four key attributes: understandability, usability, trust and usefulness.

Each element of the User Experience (UX) Model is interdependent upon the others. Products that have a strong user experience will be strong in each quadrant. Weaker experiences will lead to a root cause fault in one or more of the quadrant areas.

The definition of user experience has changed over time and will continue to change. It is influenced by experiences across all aspects of life. The attribute of Trust is the consumer perception of the product’s accuracy and therefore, its ability to start to build a relationship with it. And Usefulness measures whether or not a product is worth the time or the money spent or both. This measure culminates into a consumer’s willingness to want the product again in the future, as well as willingness to recommend it to others.

## J.D. POWER USER EXPERIENCE MODEL



## VOICE EXPERIENCE AND SATISFACTION

As we think about a good user experience, it's important to understand consumers' prior experience with the technology. While voice is arguably the most natural form of human communication, it hasn't always worked so well for the average consumer. This is especially true in the car. Year after year, vehicle owners identify traditional voice recognition systems as one of the top three complaints, which stems largely from difficulty understanding how it works, frustration with its limited capability, and prominent issues with the system's ability to accurately understand commands given.

Thanks to recent technology advances, vehicle owners are beginning to see improvements in in-car voice recognition systems. The percentage of respondents experiencing this problem has improved to 5.7% in 2018, compared to 8.7% in the 2015, per the J.D. Power Initial Quality Study<sup>SM</sup>, due in part to the incorporation of smartphone mirroring voice systems (e.g., Apple CarPlay or Android Auto). Even with the trending improvement, however, this interaction still shows up as a top complaint among consumers.

Consumers are vocal about their frustrations with trust and accuracy, especially first-time accuracy with their vehicle's voice recognition system.

*"[It] doesn't always understand what I'm saying, or does the wrong command,"* says one consumer. You can see evidence of the relationship the consumer is trying to have a relationship with their voice system in this quote:

*"I almost always lose my temper with her because she doesn't understand much of anything I say to her, which makes me mad that I get mad. Does that make any sense? Getting mad at an inanimate object?"*

Others are frustrated by limitations of the experience, with one respondent simply saying, *"wish it would do more."* Now, there is no universal definition for what consumers will deem intuitive, or which features they'll find most useful. But when the voice recognition system is unable to complete the desired request or do so with consistent accuracy, consumers will often conclude the entire system is not useful.

This perception is beginning to change. Technologies outside of the car are reshaping consumers' expectations for technology in the car, and vehicle owners who recognize the potential of voice will seek out this capability on future vehicle purchases.

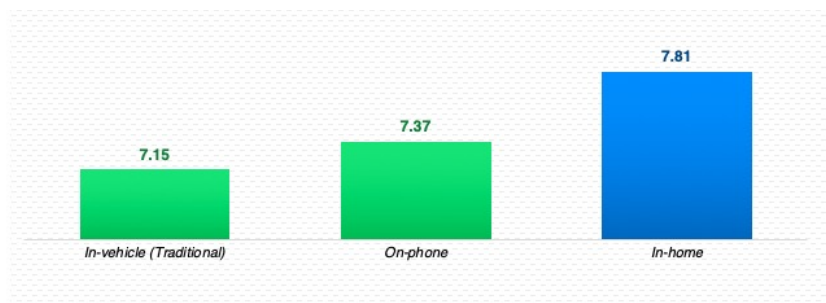
*"I can never remember the specific command terms required. I would like more natural and organic command flexibility like I have in my Echo."*

Of course, the in-vehicle environment poses unique challenges for integrating voice, such as driver distraction mitigation, microphone proximity to the user, wind noise, road noise, etc.

When examining the user experience of various lifestyle voice services, there is a constant message that appears – consumers want to use a device they are familiar with or that can be quickly learned and integrated into their daily lives. This message emphasizes the Understandability portion of the UX Model. They want their voice service to streamline their lives, not add complication.

Voice services are more ubiquitous than ever, thanks in large part to the technology being integrated into a growing number of smartphones and smart speakers. Access to the technology is one portion of the equation – user experience is the other. People with phone-based voice services rated the experience as 7.37 on average, on a 10-point scale where a 10 is considered "Truly Exceptional." Such a rating is an improvement from owners' experience with their vehicle's voice recognition services at 7.15, but it trails behind the in-home voice service experience at 7.81.

## IN-HOME VOICE SERVICES PROVIDE THE HIGHEST SATISFACTION



Q: Using a 1 to 10 scale, how would you rate your experience with your vehicle's voice recognition services feature (e.g., controls vehicle-based functions like radio, phone, navigation, etc.)? N=3,380

Q: Using a 1 to 10 scale, how would you rate your experience with your phone's voice assistant feature? N=4,446

Q: Using a 1 to 10 scale, how would you rate your experience with your in-home voice assistant device? N=5,010

Being able to easily access information, compile lists, find weather and traffic updates, find parking, call roadside assistance, or make a phone call without stopping their current task helps owners feel more productive. The essence of providing time efficiency and hands-free operation creates the UX Model element of Usefulness, ultimately simplifying the owners' lives. Consumers that are able to quickly access information or have their daily routine simplified by the in-home voice service experience drives high overall satisfaction as a result, but there is still work to do.

**Voice-enabled devices in the home have utilized the cloud for the heavy lifting computing power combined with front end acoustics, which has led to even higher satisfaction compared to phone-based voice services.** This positive experience is arguably helping consumers understand what the experience in the vehicle should be.

With all of the technological advancements in voice, and the many disruptors that the auto industry currently faces, voice may not only be part of the disruption in the auto industry but may be the centerpiece that provides consistency for the future of personal mobility.

But the story certainly doesn't end there. One of the challenges for automakers is deciding how to get voice in the car and understanding whether or not consumers care about which service is in their vehicle.

Consumers looking to bring their preferred voice service into the vehicle have several options. There are phone-based solutions where you project the voice service from your phone to your infotainment system, like Apple CarPlay and Android Auto. Alexa Auto has worked with automakers like Ford and Toyota to adopt a similar approach. And products like Echo Auto and aftermarket devices from brands like Anker and Garmin provide an easy, affordable way for consumers to add far-field voice experiences to older vehicles. However, those implementations may not offer the same complete, seamless voice experience they've come to expect at home.

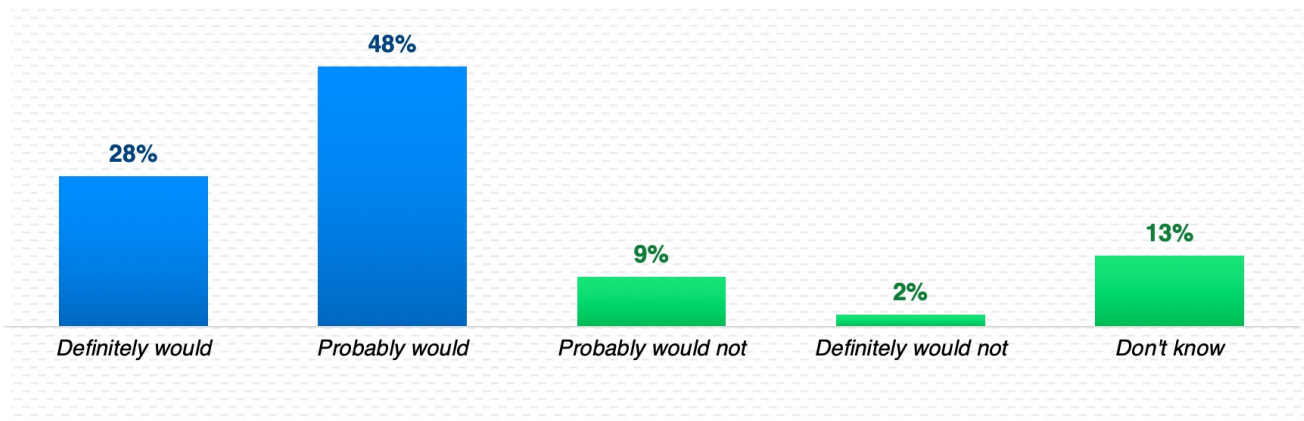
**A deeply embedded solution in the vehicle is ideal for consumers.** Amazon has created an Alexa Auto Software Development Kit (SDK) that extends the positive in-home experience into the vehicle by hooking deeply into the in-car infotainment system without the need for Bluetooth or accessory devices, and others are exploring similar embedded solutions. But, how important is it to consumers to have the same service in the car as they have at home?

The desire to carry over the same brand voice service from the home is high overall with 76% of respondents stating they probably or definitely would want the same brand of voice service they have at home to be on their next vehicle.



Voice services are becoming an increasingly natural part of daily life for customers. Those in favor of carrying over the same brand experience in their next vehicle understand the simplicity and utility that comes with consistent, extendable voice experiences as they move from the home to the car.

## 76% are interested in having the same brand of in-home voice service on their next vehicle



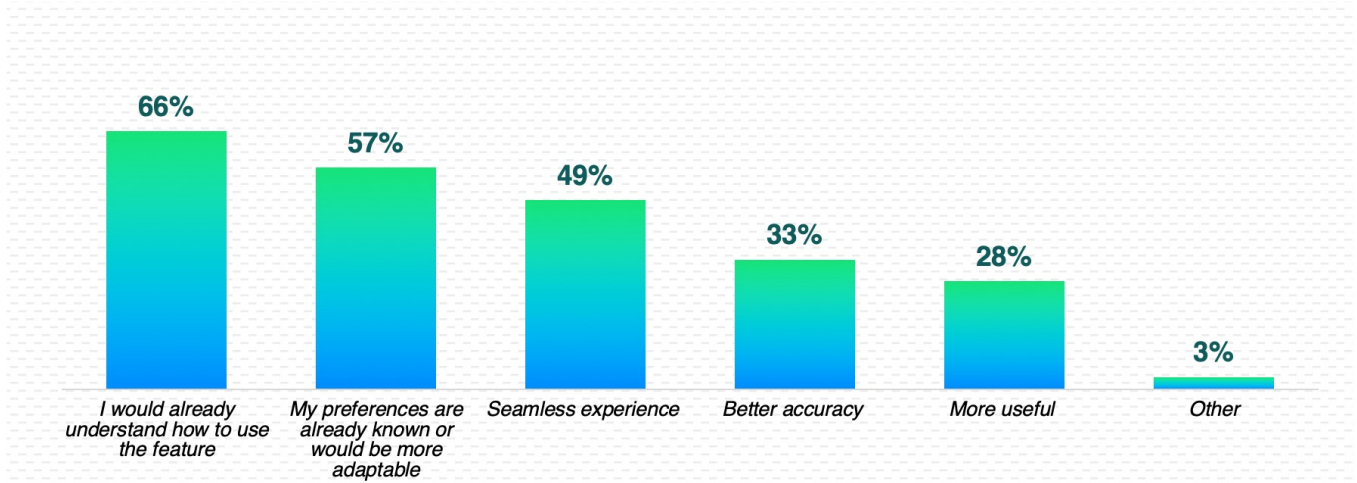
Q: Would you want to have the same brand of in-home voice assistant device installed in your next vehicle? N=5,010

## BENEFITS AND EXPERIENCES

But what is it that consumers really want? What are the experiences that they are looking to extend to other aspects of their life?

Learning how to use new technology is a challenge for many. The ability to tap into a prior or analogous experience and use it to jump-start the learning process alleviates frustration and stress for the end user. This factor is the highest benefit noted by respondents. Consistency of experience, including carrying over preferences, is also a strong motivator.

**Benefits of in-home voice service installed in-vehicle include a seamless experience**



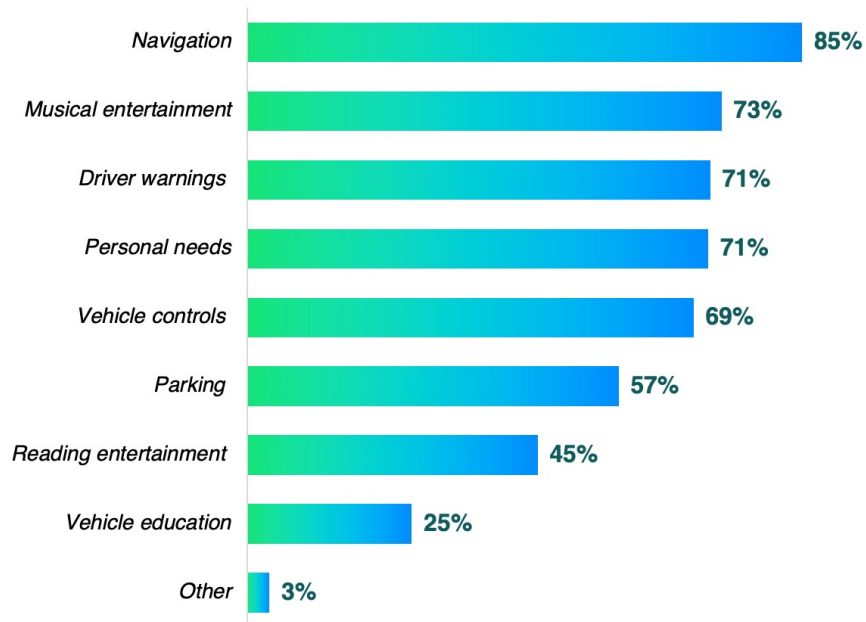
*Q: Having your current in-home voice assistant in your vehicle would provide what benefits? N=5,010*

In the vehicle, consumers want to do many of the things they do in the home like listen to music and access entertainment, schedule appointments, make a grocery list, and fulfill other personal needs. But, they also recognize the need to accomplish tasks that are specific to the experience in a vehicle. They need navigation to help get them from point A to point B – including directions, traffic, and suggestions for places nearby like restaurants or parking.

These desires mean that consumers will increasingly expect in-car voice services to seamlessly connect infotainment features with the connected car functionality, in part because they expect a consistent experience with the voice service whether they are in the car, in the home, or anywhere else. When this happens, consumers have a great experience, which ultimately benefits automakers as well. Bringing this functionality together with one voice service is important for that positive consumer experience, bolstering the experience with the car as well.



### Top desires of in-vehicle voice service combine infotainment and vehicle function features



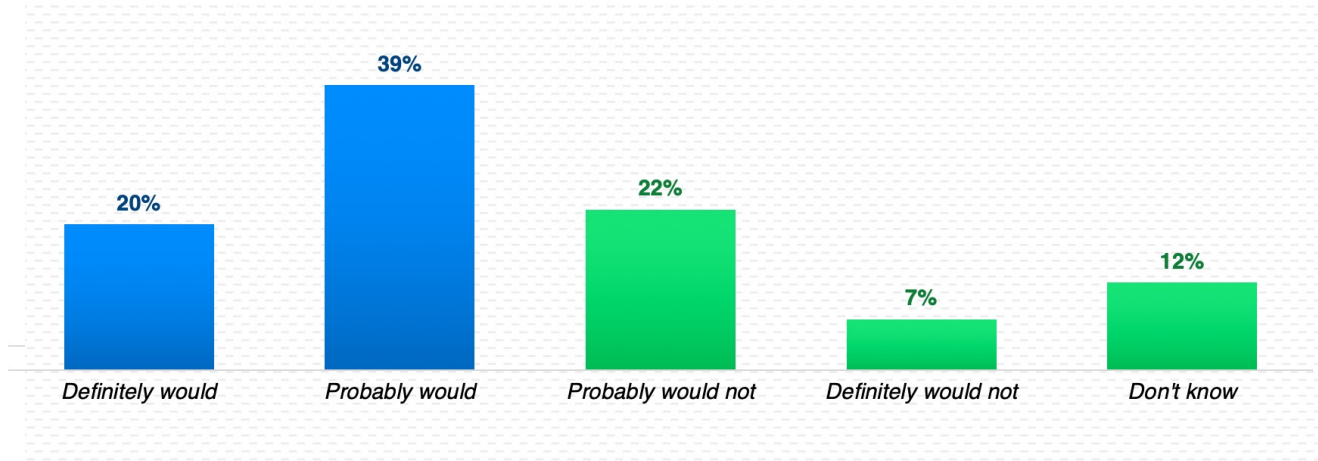
Q: What are the top 5 items you would want your vehicle voice assistant to be capable of doing that your current vehicle command system cannot? N=5,010

And that’s important because the more satisfied the consumer, the greater their brand advocacy. J.D. Power has seen evidence of this repeated in multiple studies where both problems and satisfaction are important, but satisfaction is the most important factor to drive advocacy.

### INFLUENCE OF VOICE ON PURCHASE

A satisfying experience also impacts consumers’ decision making about their next vehicle. Almost 60% of consumers said that availability of the same in-home voice service on their next car would increase the likelihood to buy from a specific car company.

**59% are more likely to buy from a certain car company if the in-home voice service is available**



*Q: If your vehicle had a branded assistant like Alexa or Google, would that make you more likely to buy from a certain car company? N=5,010*

An even larger proportion of younger consumers - Gen Y (74%) and Gen Z (79%) - said that availability of the same in-home voice service on their next car would increase the likelihood to buy from a specific car company.

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## Summary of Key Findings

To wrap things up, here are the key takeaways from this research.

- 1** First, poor execution of in-vehicle voice experiences has been a real pain point for consumers. And while voice continues to have its challenges, emerging **voice services are really beginning to solve the problem.**
- 2** Second, **consumers are looking for continuity across their life** – essentially having their experiences, preferences and interactions connected all in an effort to simplify their lives.

- 3** Third, along with that continuity, tighter integration of infotainment features and connected car functionality **all with the same voice service creates a more satisfying experience** for the consumers and increases consideration and loyalty for automakers.
- 4** Fourth, **availability of the preferred voice service in the car will increasingly impact vehicle purchase decisions.**