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Automotive Virtual Personal Assistants

- 2021 Edition -

ANALYSIS Of THE VIRTUAL PERSONAL ASSISTANT LANDSCAPE

SBD Automotive's Virtual Personal Assistants Report provides insight on today's automotive VPA market and how it is likely to shift over the next five years, based on expert industry knowledge and consumer views across three continents.

A technology analysis of the offerings from leading VPA suppliers to global automotive markets underpins the detailed review of key automotive VPA features

COVERAGE	FREQUENCY	PUBLICATION FORMAT	PAGE LENGTH
NA, CHINA, EUROPE, GLOBAL	ANNUALLY, QUARTERLY, ONE TIME	PDF, POWERPOINT, EXCEL, ONLINE	130+

Key features and benefits

- Understand what consumers want from automotive VPAs
- A deep dive into automotive VPA features, options and opportunities
- Profiles of key players in western markets and China
- Five key areas where Automotive VPA technology is rapidly developing
- Recommendations for VPA implementation prioritization
- Market anticipations, including VPA cooperation and interoperability

This research is useful for

PRODUCT PLANNERS

USER EXPERIENCE

MARKETERS

IT

ENGINEERS

Do I have access?

100+
Reports published per year

50k+
Slides of insights, forecasts & data

4,000+
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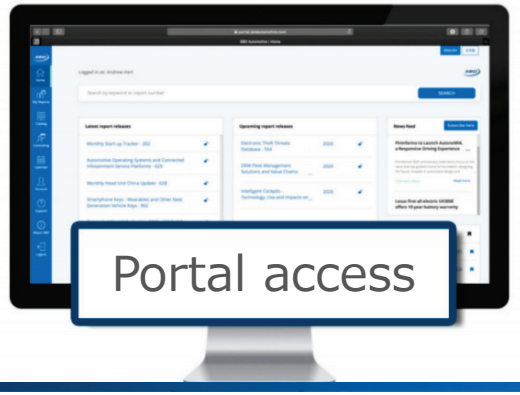

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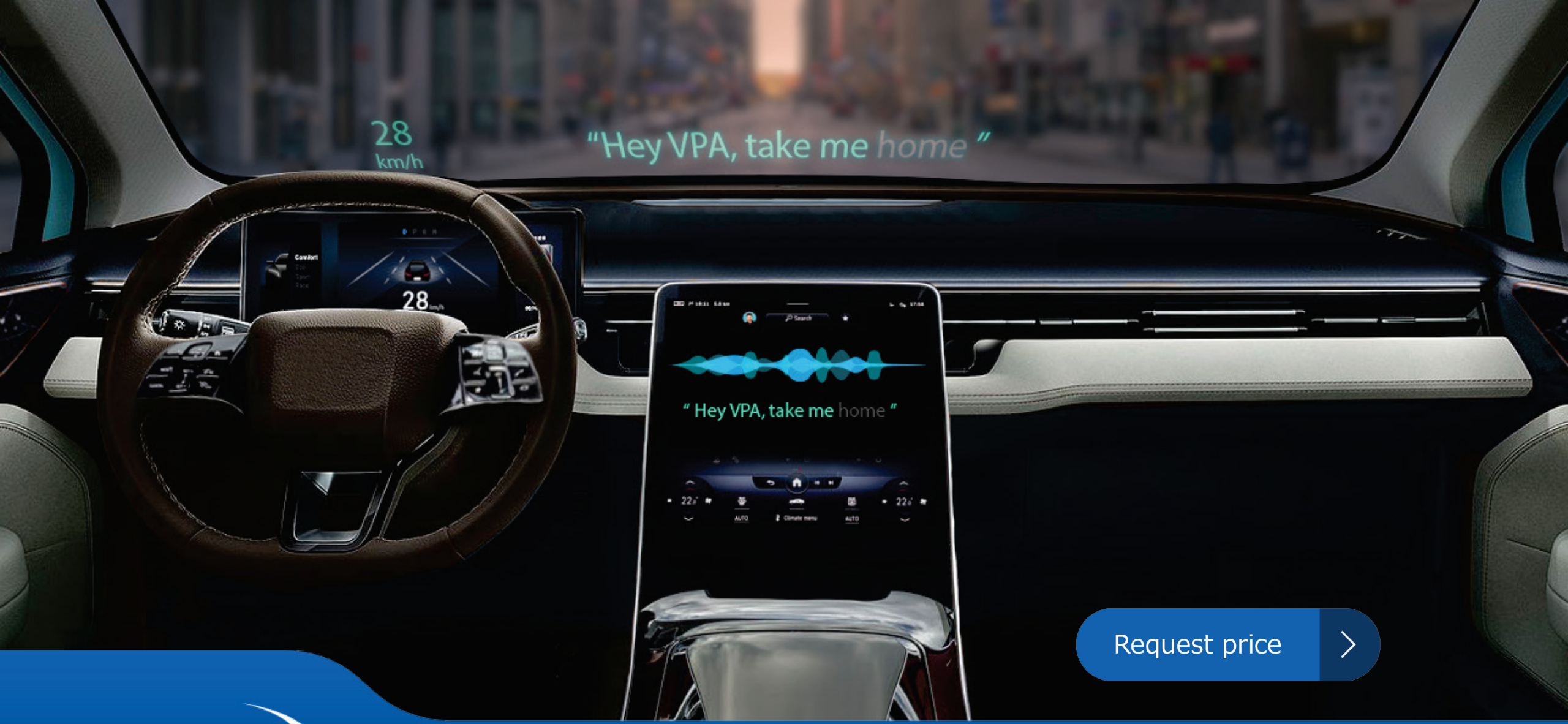

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March 2021

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Automotive Virtual Personal Assistants

Report Preview

Purpose of this report

The aim of this report is to provide the reader with insight on today's automotive VPA market and how it is likely to shift over the next five years, based on expert industry knowledge and consumer views across three continents.

A technology analysis of the offerings from leading VPA suppliers to global automotive markets underpins the detailed review of key automotive VPA features. The report categorises 25 features that VPA providers are either implementing in the latest systems or considering in the near future as basic hygiene, bronze, silver and gold. An example scenario is shown for each feature with an example integration.

The report also identifies new technologies that are coming to market to potentially take VPAs beyond the current basic media, sports, weather, and smart-home integrations that are becoming standard across suppliers. The overview of how automotive VPAs work includes an analysis of six emerging VPA technologies.

A consumer survey supports the analysis of the features and technologies coming to the market. It identifies correlations and gaps between consumer expectations for VPAs and the technology that is on the market or planned for future launch. It also highlights consumer interest and expectations of price, features, and functionality of in-vehicle VPAs, including feature bundling opportunities.

1. Analyse

Review the current state of VPA technology with profiles from 12 leading VPA providers. Assess consumer interest in VPA technology and usage with assessments of relevant technology and a consumer survey spanning three countries.

2. What

Understand the current and forthcoming technologies to define a portfolio of services. Couple this with statistics on consumer interest and willingness to pay to structure a better-informed product offering.

3. How

Use the analysis to understand the direction of the market, and regional variations in both consumer preferences and in availability and implementation of latest technologies. Use this to formulate a strategy for future implementations.

4. Who

Consider the feature offerings of all the different VPA providers. Combine this with information on consumer preferences to inform a strategy for future technology partnerships. Or, see how developments in the VPA landscape drive opportunities for other technologies.

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Example slides from the report

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VPA providers and OEMs are implementing advanced features

The leading VPA providers are working with OEMs to bring many advanced features to market. The Chinese market shows a very high appetite for advanced VPA functionality, with **the Chinese vehicles offering the best examples** of technology integration today.

Feature					HOUNDIFY	AISPEECH	阿里云	AoshuoTech	DUEROS	IFLYTEK	Mobvoi		Leading OEM Example	Other examples
Navigation	All												Commonly available	
Media	All												Commonly available	
Communication	All												Commonly available	
Web integration	✓	△	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	(China)	HONDA
Fun features	✓	△	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	理想	NIO
Vehicle control													GAC GROUP	理想
IoT/Smart home													(China)	HYUNDAI (China)
Positional detection													理想	GAC GROUP
Voice shopping / payments													Ford (China)	(China)
Avatar integration													NIO	理想 AIWAYS
Voiceprint														HAVAL
Multimodal input														No further examples
Mood detection													Not yet in market	
Multi-VPA													Not yet in market	

Data redacted

✓: Technology available in automotive market △: Supplier offers technology, but not yet in automotive market

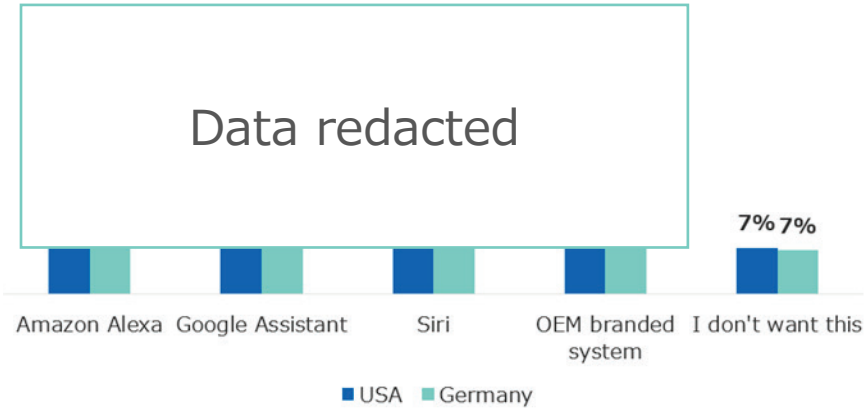
VPAs are popular in all markets, no single brand dominates demand

Findings from the consumer survey give a clear message that in-car VPAs have a high level of popularity across all markets.

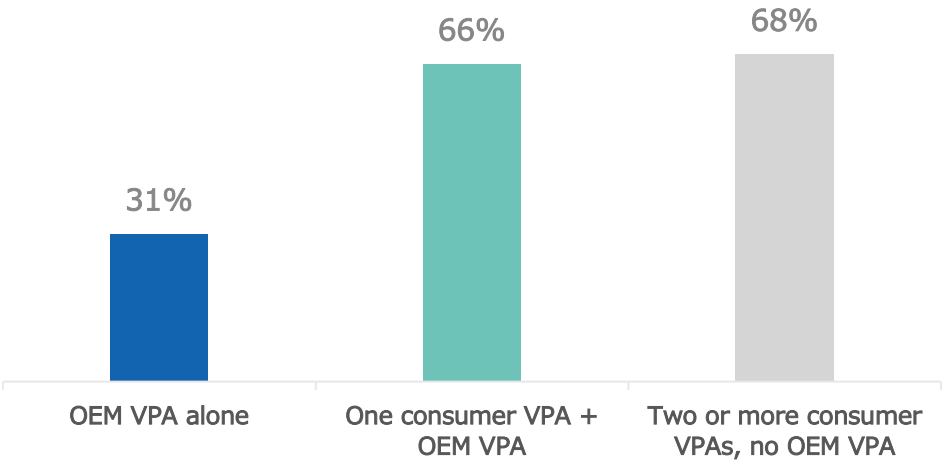
Comparing brand preference, there is no one clear winner. Consumers **demonstrate a preference for the ones they are more familiar with** outside the vehicle

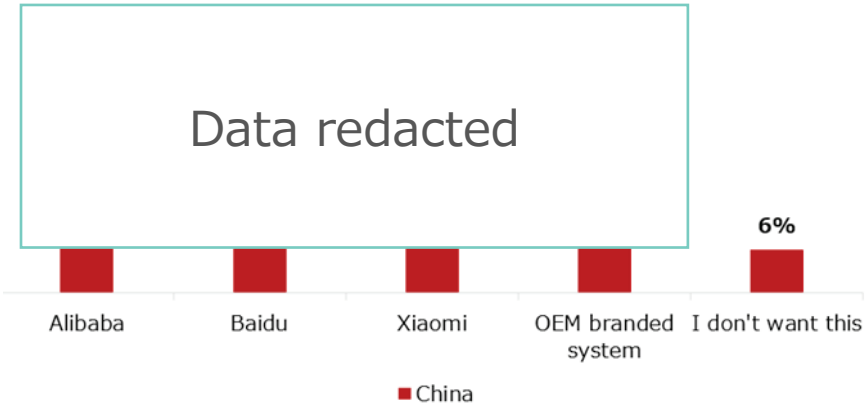
Implementing **a multi-VPAs solution will maximise the chance of providing the VPAs consumers want** and provide a higher level of functionality than is possible from any one VPA alone.

Preference for VPA brand in next car



Interest in different combinations of VPA

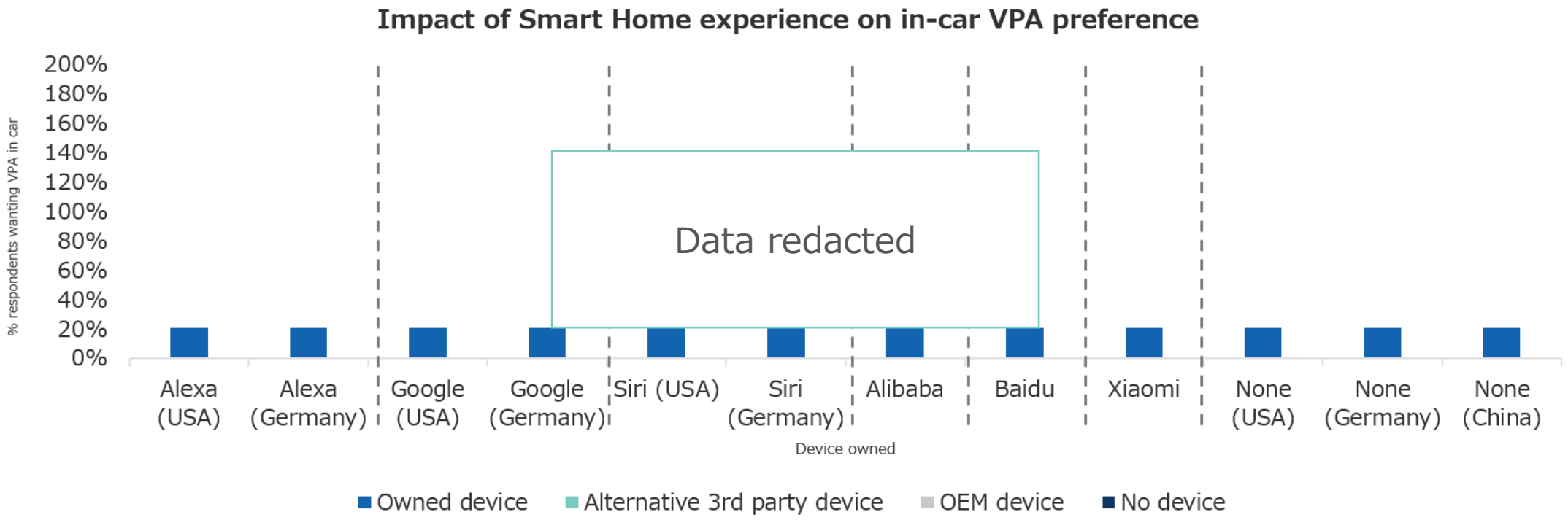




In-car VPA preference correlates with owned consumer device brand

All consumers' preferred brand of in-car VPA is strongly influenced by their home device or smartphone, with a significant majority showing a preference for the same brand. OEM-branded VPAs only compete with consumer brands where the consumer does not use a VPA outside the car.

- The preference for brand of in-car VPA is influenced by consumers' current smart home device or smartphone usage. Across all regions and brands, **a significant majority would prefer their in-car VPA to be the same brand,** as shown in the blue bars.
- A larger proportion of respondents who used VPAs outside the vehicle also **preferred an alternative third-party VPA** over an OEM one, as shown by the teal bars.
- **Consumers who do not use a VPA away from the vehicle are most likely to prefer an OEM-branded VPA**. This group is also the only group to show significant interest in no in-vehicle VPA.



VPAs are increasingly integrated with interfaces like gesture and touch

Multimodal integration can offer a more natural user interface by increasing awareness of the context of the user's input and also mimicking some aspects of human interaction. It is a significant element of fully human-like interaction but should be balanced with user privacy and perceived intrusiveness.

Background

- Multimodal integration in the context of VPAs refers to the combination of voice with other active/passive input modes such as touch, eye tracking, gesture, body movements or other biometrics.
- Most systems available today offer a combination of voice and touch input for VPA interaction, for example allowing the user to select a result of a voice search using the central display touchscreen.
- Future systems, alongside some just emerging now, such as that in the Mercedes-Benz S-Class, will offer far more sophisticated input combinations that can potentially simplify interactions, reducing cognitive load and associated distraction. They will also provide the opportunity of far richer interactions and improving accessibility for some users.

Images

Mercedes-Benz Look & Answer functionality in the S-Class

Implementation Examples

- In the Mercedes-Benz S-Class, the "Look & Answer" function allows input of certain keywords when the driver looks towards the central display. For example, if a better route becomes available, the system will ask the driver on-screen if they wishes to use it. Looking at the central display, they can answer directly by voice.
- In the Mercedes-Benz S-Class, if the driver looks at the central display while a video is playing, playback is automatically paused until they look back at the road.
- China's Chang'an UNI-T combines the in-vehicle camera and VPA to provide a greeting based on the facial expression of the driver detected by the in-vehicle camera.

Future Opportunities

- Augmenting natural, human-like conversational interaction.
- Offering increased support for differing preferences or users with impairments.
- Glance detection: understanding and responding to the target of the user's glance with the expected reaction.
- Offering a better informed understanding of the user's intentions to provide more accurate and relevant responses.

Potential Concerns

- Some interactions may be regarded as too intrusive (such as the Mercedes-Benz S-Class stopping video playback) which could lead to the driver disabling them or developing negative sentiments.
- Some users may object to being constantly watched/listened to/monitored.

Western market	Amazon	Apple	Cerence	Google	SoundHound		
China market	AISpeech	Alibaba	AoshuoTech	Baidu	iFLYTEK	Mobvoi	Tencent

Apple Siri

Key Tech	
Multi-VPA	
Multimodal Input	
Positional Detection	
Web integration	△
IoT/Smart Home Controls (bidirectional)	△
Voice Shopping/ Payments	△
Vehicle Control Integration	
Voiceprint	△
Mood Detection	
Fun Features	△
Avatar Integration	

SBD Insight

Siri has suffered from a significant lack of attention and investment when compared to its main competitors Alexa and Google Assistant. While competitor brands have pushed the development of products and services associated with their conversational AI, Apple has been happy to keep Siri exclusive to its own products and devices. While a foray into the in-vehicle experience through Apple CarPlay might have seen Siri become a more intelligent, advanced conversational AI platform, this hasn't happened.

Despite a lack of evidence to show Siri as a leader in conversational AI, Apple has built strong foundations for Siri. Through its massive number of devices in circulation around the world, Apple's ability to rapidly expand and integrate Siri into different sectors could see the company as a major threat to the current leaders in this space.

Key OEM Public Partnerships

Apple has no partnerships with OEM in place and Siri does not appear in any vehicles other than within CarPlay. However, it is expected to become evident as one of several secondary assistants used by Cerence Cognitive Arbitrator in the near future.

Markets

USA

Europe

China

Japan

India

Future Direction

Apple's technology behind Siri provides the company with a good foundation for future growth. While it seems unlikely that Apple will follow Amazon and Google with in-vehicle integrations of Siri in the short term, its in-house 'Titan' car project may see Apple making use of a Siri-powered VPA as a core user interface.

Reports at the end of 2020 name John Giannandrea, Apple's senior VP of machine learning and AI strategy being appointed the head of Project Titan. Giannandrea also leads Siri development which introduces a strong potential link between the two projects, strengthening speculation of Siri's use in Titan.

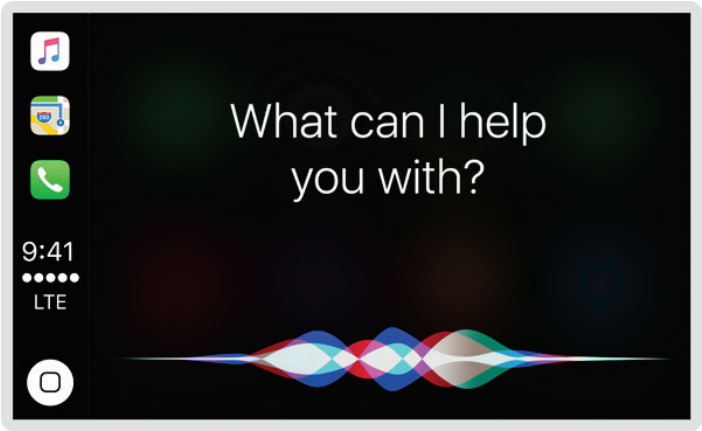
Recent News

December 2020 – Apple reportedly hands over its self-driving car project to executive who oversees Siri – link	–
September 2020 – Car keys and CarPlay. A smarter ride from start to finish – link	–
August 2020 – Porsche Taycan Becomes First Car to Integrate Apple Music, but uses Native Voice Assistant Over Siri – link	–
August 2020 – You Can Now Ask Siri to Pay for Gas at 7-Eleven – link	–

Apple Siri

Example Integration

- Unlike its main competitor Amazon Alexa, Apple's Siri does not currently feature any form of built-in integration with any vehicle models.
- A recent collaboration with Porsche saw Apple integrate a built-in version of Apple Music into the Porsche Taycan's Infotainment system. However, Porsche chose to use its own Porsche Voice Assistant over Siri.
- Instead, Siri operates primarily via Apple's smartphone mirroring solution, Apple CarPlay, displaying phone content on the vehicle's central display allowing selected Apple features and services to be utilised while in-vehicle.
- Siri's voice functionality includes web searches, navigation, communication, playing media, smart home control, ordering shopping, weather/news, messaging, and language translation.



(Source: Apple)

Languages Supported

- English
- Austrian
- Belgian
- Portuguese
- Spanish
- Cantonese
- Mandarin
- Danish
- Finnish
- French
- German
- Hebrew
- Italian
- Japanese
- Malay
- Mexican
- Dutch
- Norwegian
- Russian
- Arabic
- Korean
- Swedish
- Thai

History and Background

- Siri started life as a spin-off project, developed by the SRI International Artificial Intelligence Center which used Nuance's speech recognition engine. In April 2010, Apple acquired Siri and first integrated it within its iPhone 4S in October 2011.
- Siri finds itself present across Apple's product range – from iPads to its HomePod.
- In 2014, Siri made its way into the car with the launch of Apple CarPlay, becoming the first automotive AI assistant. However, since then, Siri has been criticised for a lack of innovation, pertaining to a lack of commands and flexibility.

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