



Amazon observations on the European Commission's preliminary report from the Consumer Internet of Things Sector Inquiry

Introduction

We welcome the publication of the European Commission's preliminary report (the "**Report**") resulting from its consumer Internet of Things ("**IoT**") sector inquiry, and the opportunity to provide comments. In its Report, the Commission has focused on the competitive landscape for consumer IoT services and smart devices and, in particular, on the influence of voice assistants and operating systems. As provider of the Alexa voice service, we are happy to offer our contribution to the public consultation.

While we appreciate, and agree with, the Report's findings that the consumer IoT and smart home device segments are dynamic, growing, and likely to see additional entrants, we believe there are aspects of the role of voice assistant and important differences between voice assistants and operating systems that should be further highlighted. We hope our comments below assist the Commission in better understanding the dynamics in this competitive and rapidly growing space.

Background on Alexa

Amazon's mission is to be Earth's most customer-centric company. Our philosophy is rooted in working backwards from what customers want and continuously innovating to provide a better experience. We aim to build trust into every interaction we have with our customers – it's at the heart of every design decision we make and every new product and experience we invent. This is also true for Alexa.

From the early days of Alexa, Amazon has focused on enabling and empowering third-party developers and device manufacturers. We know Alexa can only be successful if it provides customers with convenient access to a broad selection of their favourite consumer IoT services, and if Alexa works well with many different smart home devices. As a result, we strive to continually make it easier for developers and manufacturers to integrate with Alexa, and for customers to easily access and use the services and devices of their choice.

The services the Report refers to as "consumer IoT services" (for instance, streaming music services, online information services, car-sharing services) are generally made available on Alexa through cloud-based voice applications called "skills." Today, over 100,000 skills are available through Alexa, offering customers access to a wide range of entertainment, information, productivity, health and wellness, shopping, and other services. In many instances, customer's requests (e.g. "what are the news headlines") can be answered by more than one skill. Amazon provides several ways for customers to determine which skill Alexa should use to reply to a request. For example, customers can select their default news provider with a few clicks in the Alexa App. When the customer sets their default, e.g., to Tagesschau, the request "what are the news headlines" will be answered by the Tagesschau skill. Even if customers have set their default, they can always override that default with specific requests. In the example just mentioned, the customer can say "Play the news from Spiegel" to have their requests routed to the Spiegel skill instead of their default news provider Tagesschau. This approach provides customers with a simple way to get what they want. They can listen to the news without having to specify every time which news service should respond to their request. And customers remain free to determine which news service they wish to access at any time.

Alexa also enables customers to control many different types of smart home devices, including lights, door locks, appliances, thermostats, and more, using only their voice. We know customers purchase smart home devices from many different manufacturers, so our goal is to have Alexa work well with as many devices, from as many manufacturers, as possible. Today, Alexa is compatible with over 140,000 smart home products.

Voice assistants are not "gateways"

Voice assistants are designed to make the lives of customers easier by providing new ways of enjoying consumer IoT services and by offering customers an additional way to control smart devices like TVs, lights, cameras, and vacuum cleaners. Many of those consumer IoT services and smart home devices are not new and are not accessed or controlled primarily through voice assistants. Instead, customers often set-up, manage, and use



consumer IoT services and smart home devices primarily through other interfaces, such as mobile phones, tablets, or laptops, and then use voice assistants as a supplementary interface in circumstances where talking is more convenient than tapping or typing.

We believe the Report does not adequately account for this customer behaviour and therefore mischaracterizes voice assistants as “key gateways to the smart home” and “a central node of the consumer IoT.” Describing voice assistants as “gateways” seems to imply operators of voice assistants have the ability to limit service providers’ or device manufacturers’ access to customers, or limit customers’ ability to use the consumer IoT service or smart device of their choice. Neither is true, as facts referred to in the Report demonstrate.

As the Report states, “There are many different user interfaces for controlling smart home devices and all manufacturers of smart home devices offer several options.” In fact, the Report goes on to acknowledge, “[t]he most common user interfaces available to users are smart mobile devices and the respective smart home applications...” and “[a]cross all types of smart home devices and based on the total number of the monthly active users (“MAUs”), smart home applications emerge as the most popular user interface.” The Report also notes “touch screens, keypads, remote controls, smart buttons, smart switches, PCs and laptops” as common interfaces customers use to control smart home devices.

With respect to the services available via voice assistants, the Report states, “[m]ost of these services are accessible also outside the consumer IoT sector, for instance, via laptops and PCs or smart mobile devices” and “access to consumer IoT services via smart mobile devices is the most frequent way to access consumer IoT services.”

That mobile devices are the most used interface for accessing and controlling consumer IoT services and smart home devices is not surprising. Mobile devices are the primary way many consumers access the internet and mobile device usage only continues to grow. If any technology acts as a gateway to consumer IoT services and the smart home, it is mobile devices, not voice assistants. In fact, while the Report seems to imply voice assistant operators intend to hamper the growth, functionality, and interoperability of third-party consumer IoT services and smart home devices, the reality is quite the opposite. Voice assistant operators often have to vigorously compete for the attention of consumer IoT service providers and manufacturers to ensure their voice assistant works well with the service providers’ and manufacturers’ services and products. This is particularly true for operators of voice assistants that are not bundled with smart mobile devices, as consumer IoT service providers and device manufacturers often focus their development efforts first and foremost on mobile devices and applications. This is borne out by the responses from consumer IoT service providers in the Report. When asked to rate the importance of certain factors for competing for users with other IoT services, “interoperability with ‘must have’ voice assistants” ranked 13th out of the 18 available options, well behind “range of user functionalities available via mobile device application.”

Another statistic cited in the Report – that only “11% of EU citizens surveyed in 2020 used a voice assistant” – also belies any conclusion that voice assistants can act as gateways. Given the widespread use and adoption in the EU of consumer IoT services – including search engines, streaming music services, video-on-demand services, food delivery services, car-sharing services, and online shopping services – it is not plausible that a technology used by only 11% of EU citizens could function as a “gateway” that limits access or consumer choice in that segment.

There are fundamental differences between voice assistants and operating systems

Another area where we believe the Report does not fully capture the true dynamics of the consumer IoT and smart home device segments is in the Report’s grouping together of voice assistants and operating systems as “consumer IoT technology platforms,” and in the conclusions the Report draws about those “platforms” as a whole, without acknowledging or addressing the fundamental differences between them.

Device operating systems are able to control and manage all applications and services running on a device. For instance, an operating system defines what functionality is available to applications on the device, allocates memory, processor, and other resources necessary for applications to run, and may restrict the types and sources of applications that can be installed. Device operating systems are also characterized by their exclusivity.



That is, devices can generally only run a single operating system. And for nearly all smart devices, that operating system cannot be changed by the consumer.

Voice assistants are not operating systems and share none of these characteristics. To the contrary, voice assistants are simply applications that run on the applicable device's operating system. Voice assistants do not limit or control the other applications that can be installed or run on a device. Voice assistants do not determine what device functionality or resources other applications can access. And, crucially, voice assistants are not inherently exclusive. A device can have multiple voice assistants, in addition to numerous other applications, all available to customers simultaneously. If a given voice assistant does not provide access to a particular consumer IoT service, the device manufacturer can install another voice assistant that provides such access, or can make the consumer IoT service available directly to consumers as a separate application. This flexibility and openness can already be seen on certain smart TV devices, which provide customers a choice of multiple voice assistants, as well as stand-alone applications from a variety of video-on-demand and other entertainment services.

There will be many successful voice assistants

The inherently non-exclusive nature of voice assistants gives us conviction that there will be many winners in the voice assistant space. And we believe multiple voice assistants should work seamlessly alongside one another on a single device.

To further this vision, Amazon founded and leads the Voice Interoperability Initiative (<https://developer.amazon.com/en-US/alexa/voice-interoperability>) – now 80 companies strong – which is focused on enabling customers to access multiple voice assistants from a single device. In a world with multiple voice services, each with different capabilities, we believe customers should have the freedom to choose their preferred service for any task. The Voice Interoperability Initiative aims to deliver this experience through multiple, simultaneous voice services on the same product, each with its own 'wake word' or invocation name—enabling customers to talk to the service of their choice in a secure manner by simply saying its name.

The capability for multiple voice assistants to be available simultaneously on a single device means voice assistants will not need to “do it all” or be “general-purpose” voice assistants to be successful. Instead, voice developers will be able to focus on creating differentiated customer experiences within their areas of expertise and fulfilling specific customer needs. At the same time, consumer IoT service providers and smart home device manufacturers will have even greater flexibility in providing voice interfaces for their services and devices. If a given voice assistant is too difficult to integrate with, or seeks unreasonable commercial terms, the service provider or manufacturer can develop their own specialized voice assistant or integrate with one or more of the other voice assistants available to consumers (in addition to continuing to make their services and devices controllable via mobile applications and the other primary interfaces customers use today). And there is already significant evidence of consumer IoT service providers and device manufacturers pursuing this path, with smart speaker manufacturers, set-top box manufacturers, streaming music providers, telecommunication companies, and many others investing in their own voice service technology.

Certification programs are good for consumers, service providers, and manufacturers

We know the success of Alexa is dependent on the success of the many service providers and manufacturers who have chosen to integrate their services and devices with Alexa. As a result, Amazon has invested in creating and maintaining development tools, SDKs, APIs, documentation, and other resources to assist service providers and manufacturers in creating high-quality products that work well with Alexa. Our certification programs are an important component of those resources.

The goal of our certification programs is to help service providers and manufacturers build, launch, and market products and services that function properly, are easy for customers to set-up and configure, are secure, respect customers' privacy, and otherwise meet customers high expectations for quality and reliability. By allowing us to identify issues and work collaboratively with our partners on solutions before products and services reach customers, we are better able to protect customers, build consumer trust in this new and sometimes misunderstood segment, and help our partners increase sales and distribution of their products and services.



Customers should be safe and feel at ease – especially when it comes to their personal data

Amazon knows that customers care how their information is used and shared. We appreciate the trust that customers place in us to handle their data carefully and sensibly. We only collect personal information from our customers to provide and continually improve our products and services. And we're committed to giving customers transparency and control over their experience.

Amazon designs Alexa and Amazon Echo devices with multiple layers of privacy protection: Alexa is designed to record as little audio as possible. By default, Alexa-enabled devices only stream audio to the cloud if the wake word is detected (or Alexa is activated by pressing a button). While the recording is being made, a visual indicator appears on the customer's Echo device to indicate that the device is recording their request to stream to the cloud. Customers can also review and manage the use of their voice recordings and delete those voice recordings one by one, on a rolling basis (after 3 or 18 months), or all at once, or choose not to save any voice recordings at all.

We are not in the business of selling our customers' personal information to others. If customers use a third-party service through Alexa, we will exchange related information with that third party so they may provide the service. For example, if a customer interacts with a third-party skill, we provide the content of the customer's requests to the skill so the skill can respond accordingly. Customers can choose to grant the developer of a skill permission to access additional information to support features offered by that skill (such as the postal code of a device's location or the customer's email address).

Conclusion

We thank the Commission for the opportunity to provide our observations. We understand not all operators of voice assistants are the same, not all support the view that customers should have access to multiple voice assistants and the ability to use them simultaneously, and not all are as committed as Amazon to interoperability. However, we urge the Commission to distinguish between the actions of specific companies in this space and the characteristics of voice assistant technology itself. If authorities paint with too broad of a brush in attributing concerns with specific companies to the class of technology as a whole, it risks stifling the current rapid growth and innovation in the very dynamic and competitive IoT segment.