Cloud Gaming Is Not A Distinct Market

A Typology of Cloud Gaming Services and What It Means for

Microsoft's Proposed Acquisition of Activision Blizzard

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"[W]e provisionally find that cloud gaming services should be considered as a distinct market to console and PC." – Competition and Markets Authority[2]

"Cloud gaming is no more than a feature that provides an alternative means for gamers to access content on a device." – Microsoft Corporation[3]

"Cloud gaming is a transient technology" – Activision Blizzard Inc. [4]

INTRODUCTION

There appears to exist significant ambiguity as to what exactly cloud gaming is. In its Provisional Findings report, the Competition and Markets Authority (CMA) provisionally concludes that cloud gaming is a "distinct market" whereas The Parties (i.e., Microsoft and Activision) take the position that cloud gaming is a "feature" and that it likely constitutes no more than a "transient technology". This is not simply a matter of semantics: How we define cloud gaming should have bearing on the CMA's ultimate considerations regarding the proposed merger between Microsoft Corporation and Activision Blizzard Inc (The Merger).

If cloud gaming is indeed a distinct market, then it could make sense for the CMA to raise a separate set of potential concerns regarding The Merger's effects (e.g., a cloud gaming theory of harm). However, if cloud gaming can be deemed a feature or a transient technology, then any potential concerns raised by the CMA as they pertain to cloud gaming will have to be considered a subset of a broader set of potential concerns raised under a separate market definition (e.g., the market for video game consoles). The salience of this specific matter has been greatly amplified after the CMA published an addendum to its provisional findings in

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[2] Competition and Markets Authority (2023). *Provisional Findings Report* (page 66).
[3] Microsoft (2023). *Microsoft's Response to the CMA's Provisional Findings Report* (page 42).
[4] Activision (2023). *Activision's Response to the Provisional Findings* (page 3).

which it provisionally concludes that The Merger is no longer expected to result in a substantial lessening of competition in the market for video game consoles, leaving The Merger's potential effects on cloud gaming services as its only remaining concern.[5]

In this submission, I attempt to contribute to the ongoing debate about what cloud gaming is. Specifically, I propose a typology of cloud gaming services that may help to shed light on whether cloud gaming is indeed a distinct market or whether it is a mere feature or technology. After offering a brief background on cloud gaming, I propose a categorization of four distinct types of cloud gaming services: 1) cloud gaming as a feature, 2) cloud gaming as a platform, 3) cloud gaming as a complement, and 4) cloud gaming as an input. I then outline why I believe the cloud-gaming-as-a-platform model to date has struggled to gain traction with consumers and what this means for the proposed The Merger and the CMA's investigation into its anticipated effects. I end by offering some concluding remarks.

I base my analyses on publicly available sources. My views are informed by more than a decade of experience in the video game industry, first as a market participant (I started my professional career working for a video game developer followed by a brief stint as freelance consultant) and later as an academic researcher (my doctoral dissertation and subsequent research studies as faculty have focused on issues relating to platform competition and platform strategy, often using the video game industry as the empirical context).

The views expressed in this submission are my own. I have been following the CMA's investigation into The Merger with great interest and I felt compelled to better understand cloud gaming given the agency's emphasis on it, both here and in its Mobile Ecosystems Market Study.[6] This submission's main findings are summarized as follows:

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[5] Competition and Markets Authority (2023). *Addendum to Provisional Findings*.
[6] Competition and Markets Authority (2022). *Mobile Ecosystems Market Study Final Report*.

- We cannot speak of a distinct market for cloud gaming services. Instead, cloud streaming is a method of distribution that is used and relied upon by gaming services to varying degrees. Specifically, there are four types of cloud gaming services:

  1. **Cloud gaming as a feature.** Cloud streaming is offered as part of a consumer-facing distribution platform. It is included within a bigger bundle of services provided by the platform. Exemplar: Microsoft *Game Pass*.

  2. **Cloud gaming as a platform.** A platform provides a consumer-facing distribution platform on which all available games are streamed from the cloud. This is a standalone cloud gaming service. Exemplar: Amazon *Luna*.

  3. **Cloud gaming as a complement.** A specialized cloud-streaming technology is offered to downstream consumers who adopt it to stream a subset of games they purchased elsewhere. Exemplar: NVIDIA *GeForce Now*.

  4. **Cloud gaming as an input.** A specialized business-to-business cloud streaming technology. It can be recombined or rebranded by downstream customers who present it as their own to their consumers. Exemplar: *Ubitus*.

- Given their different scope and heterogeneous target customers, cloud-gaming-as-a-feature services (e.g., *Game Pass, PlayStation Plus*) arguably do not compete against cloud-gaming-as-a-complement and cloud-gaming-as-an-input services.

- Cloud-gaming-as-a-feature and cloud-gaming-as-a-platform services can be argued to compete against each other. However, it should be noted that a) Activision Blizzard has not released any of its internally developed titles on such services; b) it is unlikely that the presence—*or absence*—of Activision content on these services is going to make any material difference; and, c) cloud-gaming-as-a-platform services face a unique set of issues resulting in several of these services struggling to succeed.

- The CMA should reconsider its position on cloud gaming as a distinct market.

BRIEF BACKGROUND ON CLOUD GAMING

Cloud streaming as a method of distributing video games has been around for two decades. The first cloud gaming services, *G-Cluster* and *Infinium Labs* were launched in 2003. These services provided proof of concept to the idea that rather than running video games locally (or natively) on an end user's device such as a PC or a video game console, they can be stored on and streamed from remote servers in data centers and transmitted via the Internet. Users transmit inputs to servers returning video signals reflecting their commands. There are three key potential benefits to streaming video games compared to running them locally: First, streaming alleviates the end user from acquiring high-powered and potentially expensive hardware such as a next generation video game console or a high-spec personal computer. Second, because games are executed on remote servers, end users are no longer required to install video games on their local devices which frees up memory space and reduces friction. Third, the same version of a video game can be accessed from a range of different devices including video game consoles, smartphones, PCs and connected TVs. As such, developers no longer need to modify their video games for different hardware and end users can access their games from different devices depending on their preferences.[7]

Some of the earliest cloud gaming services that can be considered blueprints for services currently available are *Gaikai* and *OnLive*. *Gaikai* was created in 2008 by games industry veteran David Perry while *OnLive* was founded by tech entrepreneur Steve Perlman in 2009. These services positioned themselves through messaging that would not look out of place today. For example, when David Perry gave a keynote speech at an industry conference

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[7] Cloud gaming is often associated with new-to-the-industry revenue models, most notably subscription plans (e.g., games on demand, *Netflix*-style pricing plans). However, distributing games through the cloud is not a requirement for such revenue models and games that are distributed through the cloud can equally be offered through conventional, buy-to-play revenue models. For example, Microsoft's *Game Pass* is monetized using a subscription model, but most games offered on the service run natively. Contrarily, many of the games released through Google's now defunct cloud gaming service *Stadia* were offered on the basis of a buy-to-play model.

in 2010 he pitched *Gaikai* as follows: *"Imagine playing the latest and best games in your web browser. No hassle with installs, sign ups or patches. Literally one click and you're playing."*[8] Both *OnLive* and *Gaikai* had backing from several (at the time) established video game publishers, including 2K, Electronic Arts, THQ and Ubisoft.[9] Nevertheless, both services eventually ceased operations in part due to their technical capabilities not living up to consumers' expectations. One key requirement for cloud gaming services to be viable is the minimization of latency, otherwise known as input lag. If the time between a user's input and the resulting video signal becomes too long (e.g., longer than 100ms), the user's gaming experience is compromised. Similarly, if the quality of the video signal dips below a certain resolution this would also negatively impact users' experience. These issues are especially salient for "fast-twitch" video games such as first-person shooters (including *Call of Duty*) that require significant user input and fast reactions. Key factors in resolving these issues are the availability of high-bandwidth internet connections and infrastructural issues relating to users' geographical proximity to servers and servers' processing capabilities.

As the video game industry has grown over the last decade, servers became more powerful and internet connections got faster, there has been a proliferation of cloud gaming services entering the industry. First, console producers Sony and Microsoft have introduced cloud gaming as a part of their video game subscription services *PlayStation Plus* and *Game Pass*, respectively. To build its cloud streaming service, Sony acquired *Gaikai* in 2012 (as well as *OnLive*'s patent stack after it closed down in 2015), which powered the introduction of *PlayStation Now*, a standalone cloud gaming subscription service. The service was merged with *PlayStation Plus* in 2022. Microsoft's cloud gaming service (initially named *Project*

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[8] This quote comes from the program of the *Festival of Games 2010*, a Dutch gaming conference I attended.
[9] See: https://www.polygon.com/features/2020/10/15/21499273/cloud-gaming-history-onlive-stadia-google (accessed March 30, 2023).

xCloud) was borne out of the idea of streaming *Xbox 360* games on *Xbox One*.[10] The service was introduced in 2019 and was later integrated with *Game Pass* in 2020. Diversifying entrants, most notably from the cloud infrastructure industry, have launched cloud gaming services of their own. Google launched *Stadia* in 2019. Users could access *Stadia* from various devices, including smart TVs, PCs, *Chromebooks* and *Android* smartphones. Similar to *OnLive* before it, Google streamlined users' experience across devices by introducing a dedicated controller for *Stadia*. Google discontinued *Stadia* in 2023. Amazon, another cloud infrastructure provider, launched its cloud gaming service *Luna* in the US in 2022. It recently expanded to consumers in the UK.[11] NVIDIA, a company known in the video games industry for its high-end Graphics Processing Units (GPUs), launched the public version of its cloud gaming service *GeForce Now* in 2020. *GeForce Now* does not maintain its own distribution platform, rather it operates a novel model in which consumers can use its cloud streaming technology to stream games that were purchased elsewhere. In addition to these diversifying entrants there have been several *de novo* entrants in the cloud gaming space. These include (among others): *Blacknut, Boosteroid, GameStream, Playkey, Ubitus*, and *Streamava*.

TYPOLOGY OF CLOUD GAMING SERVICES

In this section I categorize different types of cloud gaming services. By looking at such distinguishing characteristics as who a cloud gaming service's paying customers are, the extent of vertical integration by the cloud gaming service, whether some or all of the games offered by the service can be streamed from the cloud, and the provider's business model, I arrive at a typology of four distinct types of cloud gaming services. After describing each

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[10] See: https://www.gq-magazine.co.uk/culture/article/xbox-phil-spencer-todd-howard-interview (accessed March 30, 2023).
[11] See: https://www.techadvisor.com/article/737817/amazon-luna-everything-you-need-to-know.html (accessed March 30, 2023).

model and providing exemplars, I reflect on the salient market dynamics within each type as well as the extent to which cloud gaming services across the four types can be considered to be a part of the same market. **Figure 1** graphically depicts the four types of cloud gaming services. **Table 1** presented at the end of the section summarizes the section's main findings.

Figure 1. A typology of cloud gaming services

1. Cloud Gaming as a Feature

The first type of cloud gaming service is cloud gaming as a feature. Under this model, cloud gaming is embedded as a feature within an integrated, consumer-facing distribution platform. Cloud gaming is a part of a comprehensive value proposition[12] that combines both natively run games as well as games that can be streamed from the cloud. Most video games offered by the platform under this model run natively, while a subset of the games can (also) be

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[12] A value proposition is "a strategic tool that is used by a company to communicate how it aims to provide value to customers". Payne, A., Frow, P., & Eggert, A. (2017). The customer value proposition: Evolution, development, and application in marketing. *Journal of the Academy of Marketing Science*, 45, 467-489.

streamed from the cloud. Access to cloud streaming is typically offered as part of a premium subscription tier that delivers a bundle of optional services. Other examples of such optional services include online multiplayer, cloud saves, free downloadable games, as well as several other perks. Consumers self-select into the cloud gaming offering; its adoption is not required for accessing a wider selection of games released onto the platform (e.g., these could be made available as part of a cheaper, lower-tier subscription plan that does not include cloud streaming or they could be sold under a traditional buy-to-play model). The cloud-gaming-as-a-feature model is supplied by a vertically integrated firm; a firm that produces both the cloud gaming technology as well as the consumer-facing distribution platform. Exemplars of cloud gaming services using this model include Microsoft *Game Pass* and Sony *PlayStation Plus*.

Cloud gaming under this model should not be considered a distinct market, but rather, as the name suggests, a feature that is part of a comprehensive consumer-facing distribution platform. This is not a standalone offering, given that only a subset of the users within the platform's installed base opts to pay for the premium subscription tier that includes cloud streaming. Indeed, market research broadly supports the notion that only a portion of *Xbox* consumers subscribes to *Game Pass*, and a fraction of *Game Pass* subscribers have streamed games from the cloud.[13] One reason that adoption of the cloud-gaming-as-a-feature model has been constrained concerns the limited use cases for cloud gaming under this model. From the supply side, platforms are using cloud streaming technology to release games from older console generations (e.g., *PlayStation 4*) to current generation consoles (e.g., *PlayStation 5*). Facilitating backward compatibility this way alleviates the platform from making hardware adjustments or incorporating emulation software. A selection of (current generation) video games that would normally run natively is also made available to stream from the cloud.

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[13] See for example: https://www.ampereanalysis.com/insight/games-content-subscription-market-dominated-by-services-offering-download-distribution (accessed March 29, 2023).

From the demand side, the main benefit is that this feature allows consumers to stream and play console games on their PCs. This is considered a benefit for a small portion of the platform's consumers as the advantages compared to playing on console are limited. It is likely that the number of viable use cases for cloud as a feature will increase in the future.

2. Cloud Gaming as a Platform

The second type of cloud gaming service is cloud gaming as a platform. In this model, cloud streaming is the primary means of distribution for an integrated consumer-facing platform. The value proposition for such platforms directly centers on cloud streaming: all games released onto the platform are streamed from the cloud, and the platform itself is device agnostic such that consumers can access the platform and its library of games from a range of different devices, including, for example, PCs, smartphones, tablets and connected TVs. Somewhat ironically, these platforms often are supported by hardware peripherals such as controllers, mini consoles, and other devices to facilitate and streamline the user experience across different devices. Examples of such peripherals include Google's *Stadia* Bluetooth controller, Amazon's *Fire* TV stick, and the *OnLive* mini console. Consumers can pay for games typically through a variety of different pricing plans, including free and premium subscription tiers as well as a la carte (i.e., buy-to-play individual titles). More expensive price plans will offer access to a wider range of games. Similar to the cloud-gaming-as-a-feature model, cloud gaming services using this model are offered by a vertically integrated firm; a firm that produces both the cloud gaming technology as well as supplies the consumer-facing distribution platform. Exemplars of cloud gaming services using this model are *Gaikai*, *OnLive*, Google *Stadia*, Amazon *Luna* and *Blacknut*. While Amazon *Luna* and *Blacknut* are both still operative, *Gaikai*, *OnLive* and *Stadia* have ceased operations.

Of the four different cloud gaming services discussed here, cloud gaming as a platform comes closest to constituting a distinct market to the extent that the product offered is closely tied to cloud gaming, that sellers specifically compete on the basis of a cloud gaming proposition, and that consumers select offerings primarily on the basis of cloud gaming functionality and game availability. Most notably, *Gaikai* and *OnLive* both adopted the cloud-gaming-as-platform model. Market analysis data suggests that demand for cloud gaming services of this type has been limited. For example, concurrent users for *OnLive* reportedly peaked at just 1,600.[14] Google *Stadia* recorded around 750,000 monthly active users in 2020.[15] Furthermore, it has been estimated that in 2022 Google *Stadia* and Amazon *Luna* both controlled between 0-5% of the wider segment of cloud gaming services which included Microsoft and Sony's cloud gaming services as well as NVIDIA's *GeForce Now* (discussed below in the cloud-gaming-as-a-complement section).[16] On the supply side, too, support from publishers has been limited with most cloud-gaming-as-a-platform services offering a restricted range of games with the majority of these games also being available on other, non-cloud gaming services. Below I will further reflect on why this type of cloud gaming service has struggled and why it will likely continue to do so moving forward.

3. Cloud Gaming as a Complement

The third type of cloud gaming service is cloud gaming as a complement. Cloud gaming as a complement encompasses a specialized, consumer-facing cloud gaming service wherein consumers can stream from the cloud video games they purchased on other platforms. This

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[14] See for example: https://www.theverge.com/2012/8/28/3274739/onlive-report (accessed March 27, 2023).
[15] See: https://www.businessinsider.com/google-stadia-stream-plan-partnerships-peloton-bungie-gaming-service-2022-2?r=US&IR=T (accessed March 27, 2023).
[16] See: https://www.theverge.com/2023/2/9/23591989/google-stadia-cloud-gaming-market-share-eu (accessed March 27, 2023).

model is also referred to as the Bring Your Own Games, or BYOG, model and is best exemplified by NVIDIA's *GeForce Now*.[17] Cloud gaming services of this type are considered a complement because they do not sell any video games directly to consumers, but they rather add value to a third-party distribution platform by allowing its users to stream from the cloud their existing libraries of games. Platforms that support *GeForce Now* include Valve's *Steam*, the *Epic Game Store*, as well as publisher-specific distribution platforms such as those provided by Ubisoft and Electronic Arts. In addition to purchasing games from the platforms that offer them (typically through a buy-to-play revenue model), consumers pay the cloud service provider a subscription fee for the added benefit of being able to stream their games from the cloud. The cloud-gaming-as-a-complement model therefore is offered by a specialist firm such as NVIDIA, which supplies a consumer-facing cloud streaming technology, whereas the distribution platform is offered by a third party such as Valve or Epic. Consumers in this model self-select into adopting cloud streaming functionality by combining a third-party distribution platform with a downstream cloud gaming service.

Despite operating on a more narrow scope than some of the other cloud gaming services, the cloud-gaming-as-a-complement model has gained some traction and is generally considered as having a future in the industry. (This is illustrated, for example, by the fact that Microsoft has focused its initial cloud gaming-related remedies on signing a ten-year licensing deal with NVIDIA for *GeForce Now*.[18]) Part of the reason for the model's success, I believe, lies in its pursuit of an envelopment strategy. Envelopment is a strategy wherein a new platform entrant combines its own functionality (cloud streaming, in this case) with that of an incumbent platform (a PC games distribution platform, for example) in a multi-product

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[17] *Cloudlift,* a short-lived rebrand of *OnLive* after it ceased operations in 2014, operated a similar model.
[18] See for example: https://www.reuters.com/technology/microsoft-president-says-he-has-activision-licensing-deal-with-nvidia-2023-02-21/ (accessed March 27, 2023).

bundle that leverages shared consumer relationships.[19] Put differently, by complementing an existing distribution platform, cloud-gaming-as-complement services do not need to accumulate their own installed bases for these services to be viable. Furthermore, since these services are targeted at a narrow and rather specific customer segment with fairly limited use cases (high-end streaming), these services do not require the same scale of game offerings that standalone cloud gaming services require to be considered attractive by consumers. In the context of the discussion of whether cloud gaming services are a distinct market, it should be noted that the cloud-gaming-as-a-complement model requires the existing market structure of non-cloud gaming services to be in place—these services piggyback onto the user bases of third-party distribution platforms. As such, cloud-gaming-as-a-complement should not be considered a distinct market but rather a complement to the existing market for video games.

4. Cloud Gaming as an Input

The fourth type of cloud gaming service is cloud gaming as an input. Unlike the prior three cloud gaming services, which are all consumer facing, this type of cloud gaming service operates on a business-to-business (or B2B) basis. In this model, a specialized B2B cloud gaming technology is offered as an input to downstream, consumer-facing distribution platforms that may choose to recombine the cloud streaming technology with their own native game distribution offering, not unlike the cloud-gaming-as-a-feature model discussed earlier. Nintendo relies on this model as a solution for providing technically demanding, high-fidelity video games that the *Switch* console is not capable of running natively, and to offer games initially released on other distribution platforms for which the costs of porting could be excessive. In other cases, the downstream platform does not recombine the cloud

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[19] Eisenmann, T., Parker, G., & Van Alstyne, M. (2011). Platform envelopment. *Strategic Management Journal*, 32(12), 1270-1285.

streaming technology with any native game distribution capabilities, but merely rebrands the cloud gaming input as its own. This might be an attractive proposition for customers outside the video games industry looking to bring a gaming solution to their end consumers, such as hospitality companies.[20] This type of offering is colloquially referred to as a White Label product. In any case, the supplier of the downstream distribution platform is the paying customer for the cloud-gaming-as-an-input service, whereas the end consumer accesses (and pays for) the bundle of services supplied by the downstream distribution platform. Exemplars of cloud gaming services operating the cloud-gaming-as-an-input model include *Ubitus* (which supplies Nintendo's Switch cloud streaming technology) and *GameStream*.

On the supply side, cloud-gaming-as-an-input services provide rather comparable offerings and I would imagine that there can be fierce competition between them. For example, the number and quality of games available on these services, the technical proficiency (e.g., the extent of input lag and end users' geographical proximity to servers), as well as the degree of customization for downstream customers are all highly important and observable characteristics influencing customers' decisions. On the demand side, however, the addressable market for services like these appears highly heterogeneous and varied. For instance, whereas Nintendo (a video game console producer) is one of *Ubitus* main customers, *GameStream* seems to position itself to appeal specifically to hospitality providers such as Accor and MGM Resorts. Wiztivi's *Streamava*, another cloud-gaming-as-an-input service, promotes itself to appeal to telecom providers such as France's SFR.[21] There also likely exist numerous outside options for such customers (e.g., non-cloud gaming or even non-gaming products), the inclusion criteria of which will depend on the customer's desired

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[20] The website of the cloud-gaming-as-an-input service *GameStream* suggests that several hospitality companies, including MGM Resorts, Accor, and HoistGroup have signed up for the cloud gaming service. See: https://gamestream.biz/#they_are_working_with_us (accessed March 28, 2023).
[21] See for example: https://www.wiztivi.com/case-study/sfr-gaming/ (accessed March 28, 2023).

use case. The delineation between competitors and substitutes can be a matter of interpretation in any market, but this suggests that cloud-gaming-as-an-input providers will compete as much with each other as with input suppliers that do not produce or offer any cloud gaming services. Noticeably, cloud-gaming-as-an-input services compete for markedly different customers than cloud-gaming services operating one of the other three models.

Table 1 documents the four types of cloud gaming services as discussed above.[22] From the table and the preceding discussion it should be apparent that cloud streaming technologies are leveraged in different ways by these services and that their value propositions and target customers are highly varied. For example, whereas three out of four cloud gaming services are targeted at end consumers (i.e., gamers), the cloud-gaming-as-an-input model targets its services primarily at upstream business customers. Moreover, two out of four cloud gaming services (cloud gaming as a feature and cloud gaming as a platform) provide rather integrated services by offering their cloud streaming technology in conjunction with a consumer-facing distribution platform. The other two cloud gaming services (cloud gaming as a complement and cloud gaming as an input), however, are more specialized in their offering and mostly focus on providing cloud streaming technology. Additionally, while services such as Microsoft's *Game Pass* and Sony's *PlayStation Plus* offer a mix of natively

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[22] It should be noted that the types of cloud gaming services presented here constitute *ideal types*. In practice, we might see certain cloud gaming services that can be harder to neatly fit into one of these categories. The cloud gaming service *Netboom*, for example, seems to operate a hybrid model where some games are offered directly by the platform (cloud-gaming-as-a-platform) whereas others can be accessed only when consumers own them on another platform such as *Steam* (cloud-gaming-as-a-complement). *Utomik* is another example of a cloud gaming service that operates a hybrid model. Even though it is positioned mostly as a cloud gaming platform (cloud-gaming-as-a-platform), at the time of writing, however, only 241 out of 1,429 titles were available to stream from the cloud whereas the remaining 1,188 titles run natively, on the consumer's PC (cloud-gaming-as-a-feature). Even other cloud gaming services will mostly fit into one of the four ideal types, but they might offer some specific features that can be harder to neatly classify. In this light, consider the case of Ubisoft games on Amazon's *Luna*. If a consumer has already purchased games directly from the Ubisoft Store, then they can link their Ubisoft account to stream a subset of those games from the cloud (cloud-gaming-as-a-complement). Alternatively, consumers can pay Amazon a monthly subscription fee for accessing games published by Ubisoft, without having to purchase them from Ubisoft first (cloud-gaming-as-a-platform). Industry evolution theories suggest that while such hybrid models might proliferate during the early stages of an industry's lifecycle, once the industry begins to mature, one or a few crystalized types of offerings will emerge as the dominant design(s).

Table 1. Overview of different cloud gaming services and their distinguishing features

	Could gaming as a ...			
	Feature	**Platform**	**Complement**	**Input**
Service position in value chain	Downstream - end user is paying customer	Downstream - end user is paying customer	Downstream - end user is paying customer	Upstream - downstream platform is paying customer
Service extent of vertical integration	Integrated - cloud streaming technology *and* consumer-facing distribution platform	Integrated - cloud streaming technology *and* consumer-facing distribution platform	Specialized - cloud streaming technology only (consumer facing)	Specialized - cloud streaming technology only (business-to-business)
Games offered by service via cloud	Subset - some of the games offered can be streamed from the cloud, others run natively	All - all games offered can be streamed from the cloud	All - all included games can be streamed from the cloud	All - all games offered can be streamed from the cloud
End user consumes cloud gaming as	Bundle - cloud gaming is consumed in conjunction with native games and optional additional services	Standalone - cloud gaming is consumed as standalone product. End user does not need to own games elsewhere	Bundle - cloud gaming is consumed as part of a bundle. Consumer must own games elsewhere to stream them	Bundle & standalone - how cloud games are consumed depends on downstream distribution platform
Service provider business model	Platform - service connects end users on one side of the market with games publishers on the other	Platform - service connects end users on one side of the market with games publishers on the other	Complementor - service adds value to users' games purchased elsewhere (Bring Your Own Games)	Component supplier - service licenses content from games publishers, passed on as to downstream platform
Model exemplars	Microsoft *Game Pass,* Sony *PlayStation Plus*	*Gaikai*†, *OnLive*†, Google *Stadia*†, Amazon *Luna*, *Blacknut*	NVIDIA *GeForce Now, Boosteroid, Playkey, Cloudlift*†, *Rainway*†	*Ubitus, GameStream,* Wiztivi's *Streamava*

Note: † = ceased operations.

run games and games that can be streamed from the cloud, the remaining three cloud-gaming services focus exclusively on distributing games from the cloud. Finally, these services operate different business models. While both the cloud-gaming-as-a-feature and cloud-gaming-as-a-platform services operate the traditional—for the games industry, that is—platform-based business model of connecting buyers and sellers, the other two types of cloud gaming services operate different business models. For example, whereas the cloud-gaming-as-a-complement model operates a complementor business model by creating additional value for games sold elsewhere, the cloud-gaming-as-an-input model operates a traditional component supplier model. In all, while all of these services incorporate cloud streaming technology into their value propositions to some degree, they provide highly differentiated offerings—often targeted at highly heterogeneous and divergent target customers.

WHY HAS CLOUD GAMING AS A PLATFORM STRUGGLED?

Despite often being heralded "the future of gaming" cloud-gaming-as-a-platform services such as Google's *Stadia* have struggled to gain traction, let alone succeed.[23] Some of the earliest attempts at offering cloud streaming technology, *Gaikai* and *OnLive* most notably, adopted the cloud-gaming-as-a-platform model and failed. And even a well-resourced effort by Google—at a time when streaming technology and input lag had significantly improved—did not manage to persuade consumers to fully embrace the cloud-gaming-as-a-platform model. Judging by recent market share data, Amazon's *Luna* also is not managing to impress

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[23] See for example: https://www.gamesindustry.biz/after-stadia-is-the-future-still-bright-for-cloud-streaming-opinion (accessed March 28, 2023).

as of late.[24] Here I will reflect on why the cloud-gaming-as-a-platform model in particular has struggled to gather steam and why this might remain the case going forward.

First, generally speaking, any nascent two-sided platform offering has a hard time taking off. Platforms are characterized by indirect network effects such that the more customers on one side of the market have adopted the platform (e.g., game publishers), the more attractive the platform becomes to customers on the other side of the market (e.g., gamers). This creates a "chicken-and-egg" problem in which neither side of the market is eager to join the platform without the other side joining first.[25] The platform producer will have to solve for this problem (e.g., through subsidies or first-party titles as Epic is currently doing for its *Epic Games Stores*). None of the other cloud gaming services face this issue to the same degree: Sony and Microsoft, for example, added cloud streaming to their existing platforms which already boasted many games and gamers. NVIDIA has cleverly adopted an envelopment strategy where it has been able to co-opt the user bases of existing platforms such as Valve's *Steam* and the *Epic Games Store*. Cloud-gaming-as-an-input services such as *Ubitus* have embraced a different model altogether where a fixed bundle of games and cloud streaming technology is sold to business customers. Game publishers are generally willing to launch existing games on different platforms—be they new or established ones—but this is not very helpful to any nascent platforms since these games can also be purchased and played on several other platforms; it leaves budding platforms little to differentiate themselves on.[26]

Second, cloud-gaming-as-a-platform services also confront several specific issues. First, the initial target audience of early adopters for such services tends to be enthusiast

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[24] See: https://www.theverge.com/2023/2/9/23591989/google-stadia-cloud-gaming-market-share-eu (accessed March 27, 2023).

[25] Hagiu, A. (2014). Strategic decisions for multisided platforms. *MIT Sloan Management Review*, 55(2), 71.

[26] For an academic discussion on the effects of "multihoming" on platforms and complementors, see: Cennamo, C., Ozalp, H., & Kretschmer, T. (2018). Platform architecture and quality trade-offs of multihoming complements. *Information Systems Research*, 29(2), 461-478.

gamers, who likely already own a high-powered PC or current generation video game console.[27] The appeal of leveraging state-of-the-art cloud computing technology might not be overly attractive to such "hardcore gamers". This mismatch between value proposition and intended target audience—which further exacerbates the chicken and egg problem—is much less pronounced in the cloud-gaming-as-a-feature and cloud-gaming-as-a-complement models where a subset of highly identified consumers can self-select into these services. Platforms like Microsoft *Xbox* and Sony *PlayStation* appeal to a broader audience because of their deeper and wider library of content, whereas a service like NVIDIA's *GeForce Now* does not require an overly large user base given its more focused value proposition. Second, cloud-gaming-as-a-platform services so far have not seen any real "killer apps". Killer apps are not only high-quality and exclusive video games, but they also uniquely demonstrate or prove the core value of the platform technology for which they are developed.[28] Developing a killer app is no easy feat by any means, but it can be particularly challenging when the platform technology is not overly visible to end users or differentiated from a consumer's perspective.[29] The implication here is that it might be difficult for any standalone cloud gaming service to be truly successful in the absence of games that uniquely demonstrate cloud streaming's appeal to a wide base of consumers. Third, these problems are compounded by the fact that video games are often developed for specific devices and use cases. Mobile games, for example, are used for short playing sessions and have traditionally catered to a more casual gaming audience while console games and PC games are used for longer-lasting playing sessions catered to a more devoted audience of gamers. It is no surprise, therefore, that even for gaming franchises with incredibly wide appeal such as *Call*

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[27] For academic research on the difference between early and late adopters of video game platforms, see: Rietveld, J., & Eggers, J. P. (2018). Demand heterogeneity in platform markets: Implications for complementors. *Organization Science*, 29(2), 304-322.

[28] Examples include *Wii Sports* (motion sensing gameplay) and *Angry Birds* (Apple's touchscreen interface).

[29] See for example: https://www.polygon.com/a/life-in-japan/Yoichi-Wada-cloud (accessed March 28, 2023).

of Duty, *FIFA* and *Super Mario*, dedicated versions have been developed for mobile phones. Thus, even if cloud-gaming-as-a-platform services can technically be accessed by consumers from a wide range of devices, this does not imply that their offering will be equally appealing to everyone across all those devices. Again, this issue is less problematic for some of the other cloud gaming services that tend to be more tightly anchored to specific devices such as gaming consoles (i.e., *Game Pass*, *PlayStation Plus*, *Ubitus*) or PCs (e.g., *GeForce Now*).

WHAT DOES THIS MEAN FOR THE MERGER?

It is my position that we cannot speak of a "distinct market" for cloud gaming services. Instead, cloud streaming is used in different ways by different companies that target different customers. The market is not defined by whether or not gaming services compete (either partially or in full) on the basis of cloud streaming, but rather by whether they offer similar value propositions—which may or may not involve cloud gaming—that are targeted at overlapping customer segments. I identified four categories of cloud gaming services, each with its own value proposition and in some cases with little overlap in target customers. The services populating these categories can be argued to compete in different markets.

For example, cloud-gaming-as-a-complement services such as *Boosteroid* and NVIDIA's *GeForce Now* do not actively compete against Microsoft when it comes to their cloud gaming services; *Boosteroid* and *GeForce Now* are specialized cloud-streaming complementors, whereas Microsoft offers an integrative gaming platform with *Game Pass* in which cloud gaming acts as a small (but significant) feature. Similarly, *Xbox* and *Game Pass* do not compete against cloud-gaming-as-an-input services such as *Ubitus* and *GameStream*, which also are much more specialized in their offerings and are targeted at drastically different customers (see **Table 1**). For instance, most of *GameStream*'s customers are

businesses that are not even part of the video games industry. It should not come as a surprise therefore that Microsoft has been quick to sign ten-year licensing deals for Activision content with NVIDIA, Boosteroid and Ubitus as part of its remedies drive.[30] Bringing Activision's games to services like these can help grow Microsoft's publishing revenues while posing little substitutive threat to its own gaming platforms. Microsoft's main competitor in video games is Sony, the other cloud-gaming-as-a-feature provider, and the CMA has already concluded that The Merger is unlikely to result in a substantial lessening of competition in the market for the supply of console gaming services (in the UK).[31] To the extent that Microsoft will stream Activision's games from the cloud following The Merger, it will likely further spur innovation and competition in console gaming between Sony and Microsoft.

The two types that are closest in terms of their value proposition and target customers are the cloud-gaming-as-a-feature and cloud-gaming-as-a-platform models. Both models provide integrated offerings that combine downstream video game distribution platforms with cloud streaming technology. They both target end users as their main customers. The models differ, however, in the extent that they rely on cloud gaming with cloud streaming being more integral to the cloud-gaming-as-a-platform model. While platforms like *Game Pass* and *Luna* have some overlap in terms of their content offerings (e.g., Ubisoft and Capcom are examples of publishers that release some of their games across both types of services), it should be noted that Activision has not released any games on Amazon *Luna*.[32] Activision published only one game on Google *Stadia* before it closed down,[33] *Sekiro: Shadows Die Twice*, but this game was developed by an independent, Japanese game developer, FromSoftware.[34] Of

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[30] See: https://www.techpowerup.com/305956/microsoft-signs-10-year-long-deals-with-ubitus-and-boosteroid-cloud-gaming-services (accessed March 29, 2023).

[31] Competition and Markets Authority (2023). *Addendum to Provisional Findings*.

[32] See: https://luna.amazon.com/search?query=activision&sort=relevance (accessed March 29, 2023).

[33] See: https://en.wikipedia.org/wiki/List_of_Stadia_games (accessed March 29, 2023).

[34] Activision likely acted as publisher in the US market because FromSoftware either lacked the required licenses or capabilities to publish games outside of its home market of Japan, where the game was indeed self-published. See: https://en.wikipedia.org/wiki/Sekiro:_Shadows_Die_Twice (accessed March 29, 2023).

course, hypothetically speaking, it could be that Activision as a independent company may become more inclined to release its games on such cloud gaming services in the future. However, in the context of evaluating whether The Merger ought to be blocked or not, I would take into consideration the following: 1) A nascent platform cannot be foreclosed on an input it never had access to in the first place.[35] 2) It is highly unlikely that games from a single publisher (however successful) can either tip the market in favor of a single platform with access to these specific games, or that it can prevent any competing platforms from becoming successful (e.g., Microsoft and Sony never had access to Nintendo's library of wildly successful games). 3) As discussed in a prior section, the future of the cloud-gaming-as-a-platform model is highly uncertain to begin with. It seems plausible that if cloud gaming is to play a more central role as a distribution method, then it will be in the context of a cloud-gaming-as-a-feature, cloud-gaming-as-a-complement, or cloud-gaming-as-an-input service—all three of which will get access to Activision games if the deal is approved.

Finally, while any upstream activities in the provision of cloud streaming technology such as servers, storage, networking security, and operating systems are outside the scope of this submission, it should be noted that Microsoft's *Azure* is one of the key players in the infrastructure space (alongside other providers such as Amazon Web Services (AWS), Google Cloud and Alibaba Cloud).[36] *Ubitus* and *GameStream*, for example, rely on *Azure* infrastructure for their cloud gaming services. From an "ecosystem perspective" it does not appear to make economic sense for Microsoft to be focused primarily on capturing value in downstream activities of its value chain (e.g., by withholding or degrading Activision content or by charging cloud gaming services excessive prices for accessing such content) if it

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[35] I am neither a lawyer nor an economist and I realize that there is a specific and technical meaning to the term foreclosure. However, at least in the US, cases such as *Trinko* and *Aspen Skiing* appear to suggest that prior access is required for a buyer to be considered foreclosed. Either way, Activision's prior conduct in terms of which platforms it did (not) release games on as an independent company (and why) should not be ignored.
[36] See: https://dgtlinfra.com/top-10-cloud-service-providers-2022/ (accessed March 29, 2023)

negatively affects value creation in the—scalable but competitive—upstream infrastructure segment (e.g., by losing cloud gaming services to competing infrastructure providers, or if these services cease operations due to poor quality content or low margins). From the perspective of *Azure*, Microsoft benefits when (non-competing) cloud gaming services thrive and when Microsoft is considered an attractive supplier in the infrastructure segment.

CONCLUDING REMARKS

There exists significant ambiguity as to whether cloud gaming should be considered a distinct market or not. The CMA's final decision on whether to block or clear Microsoft's proposed acquisition of Activision Blizzard hinges in large part on this very question. Here, I have put forward the argument that we cannot combine all cloud gaming services into a single, clearly defined market definition. Rather, we can identify four types of gaming services that each use and rely on cloud streaming technology in different ways. Microsoft's *Game Pass* offers cloud streaming as a feature; cloud gaming is an ingredient to a much broader value proposition that also includes natively run games as well as other services. Cloud-gaming-as-a-feature services arguably do not compete against cloud-gaming-as-a-complement (e.g., NVIDIA's *GeForce Now*, *Boosteroid*) and cloud-gaming-as-an-input services (e.g., *Ubitus*, *GameStream*) due to their more specialized offerings and differences in target customers. Microsoft arguably does compete against cloud-gaming-as-a-platform services such as Amazon's *Luna* and *Blacknut*—though not so much because they both stream games from the cloud, but rather because they both provide consumer-facing video game distribution platforms to overlapping customer bases. To date, however, Activision Blizzard has not released any of its internally-developed video games on any of the cloud-gaming-as-a-platform services. Moreover, several cloud-gaming-as-a-platform services have ceased

operations as this type of service has generally struggled to gain traction with consumers. Consumers' willingness-to-pay for standalone cloud gaming services apparently is low and this is perhaps the strongest indication that cloud gaming should not be considered a distinct market: Cloud streaming is a potentially promising distribution method that will very likely continue to be used and relied upon to various extents by different companies with different offerings aimed at a diverse set of customers that can be both end users and business-to-business customers. It behooves the CMA—and other agencies—to view it as such.