*Master Thesis Business Administration & Communication Science*

# *The cloudy reality of game streaming*

***"An analysis into the consumers' willingness to pay for cloud gaming services."***

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## Abstract

Cloud gaming is a relatively new form of consuming video games. It works by having games streamed from data centers to devices and screens consumers already own. It thus requires no console hardware purchase on the consumer's end to function. Cloud gaming services often take the form of a subscription service where consumers pay a pre-determined monthly fee to access an ever-changing library of on-demand software, not unlike how Netflix works for movies. Cloud gaming services have however struggled to take off after their market introduction, having only a single-digit percentual market share compared to more traditional game consoles and PC alternatives. This research paper aimed to analyze the potential relationship between the independent variables of digital value perception, the sense of ownership, perceived control, and consumer habits on the willingness to pay for cloud gaming services. The variables of perceived control and consumer habits were part of the theoretical model as moderating variables between the relationship of the independents. Consumer habits are hypothesized to moderate the relationship between the sense of ownership and the willingness to pay and perceived control moderating between digital value perception and the willingness to pay. These variables were chosen to examine the consumer-psychological effect they may have on the low adoption rate of cloud gaming services. To collect data a survey was constructed and shared through social networks, resulting in 722 completed responses. The survey measured the background information of the respondents, all five identified variables on a 7-point Likert scale, and also included three open-ended questions. The statistical output of the conducted survey showed that only consumer habits had a significant effect on the willingness to pay. In total, the model reached an explained variance of 20.6% on the willingness to pay. In the open questions, a lot of participants cited technical performance, game selection, and pricing/monetization to be their main points of contention, not the previously identified variables, outside of the sense of ownership. This could be valuable information for future researchers to uncover the full picture as to why cloud gaming services continue to struggle in today's competitive video game industry.

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# 1. Introduction

With the improvements in technology and digital infrastructure many industries, such as film and music, have shifted towards a distribution method that predominantly favors streaming cloud services (Allen-Robertson, 2013). The shift from distributing physical products such as CDs and Blu-rays has moved towards selling access to a cloud-based service, combining digitalization and servitization (Favoretto et al., 2022). This transition is often a result of technologies improving and maturing over time, as well as the incentives companies have in shifting from physical media towards cloud-based services, due to the returning monthly revenue a subscription-based earning model provides (Goldfarb & Tucker, 2019).

In recent years the way of consuming video game content has also changed, although not to the same degree as other media. Physical media still plays a large role in the current console market, while the PC market primarily favors downloads. This is unlike the movie and music industry, as they are currently most often consumed through cloud streaming services such as Netflix and Spotify. This new form of media distribution has also been introduced into the videogame landscape in the form of cloud gaming. Initiatives by companies such as Google and Microsoft have, however, not been successful in convincing the public that this shift to cloud gaming is one to be welcomed over the existing alternatives. There are concerns over the servitized online streaming model and how this affects product ownership. With companies struggling to properly establish cloud gaming as a viable business model, the future of the market remains far more uncertain than those of music and film before it (Wolens, 2022).

This research paper aimed to analyze the potential relationship between the independent variables of digital value perception, the sense of ownership, perceived control, and consumer habits on the willingness to pay for cloud gaming services. The variables that take center stage in this research paper are from the field of consumer psychology (Bettman, 1986). The main research question which this paper aims to answer reads as follows:

> *‘’In what ways do digital value perception and sense of ownership relate to the willingness to pay for cloud gaming offerings?’’*

The willingness to pay serves as the dependent variable of this paper. The willingness to pay indicates whether or not consumers are willing to spend money on a product/service or not. It can also indicate how much consumers are willing to spend based on their perceived value (Schmidt & Bijmolt, 2019). One of the two independent variables that influence the dependent variable being researched in this paper is digital value perception. It refers to how customers perceive the value that they derive from a digital/online product and/or service when compared to the cost or expenditure. As the name implies the perception of value is key, not the literal monetary value (Boksberger & Melsen, 2011). The second independent variable is known as the sense of ownership. It is defined as the feeling as if the purchased item/product is fully yours and that you are the only one who can decide when, why, and how to use it (Li & Atkinson, 2020).

In addition to these two independent variables, two moderating variables were introduced, the first of which is existing consumer habits. It can be defined as consumption patterns that have been ingrained in certain markets and have persisted over a long period Pollak, 1970). The second moderating variable is known as perceived control. This moderating variable can be defined as giving the consumer the sense that they are a part of the value creation process by being in control and using the product and/or service (Guo et al., 2015).

There has been little to no research done on the subject of market adoption and the willingness to pay for ongoing subscriptions to cloud gaming. This paper aims to fill this gap in the body of knowledge by conducting consumer-oriented research into the psychological variables that might influence the willingness to pay for such services. By doing so adding new information and data to the scientific community and potentially creating new interesting results and data which could serve as leads for future researchers into the subject of cloud gaming adoption.

## 1.1 Market synopsis

The at-home video game market has been around since the seventies, with the first at-home game systems known as consoles appearing in people's living rooms in the seventies with the rise of Pong machines. As the years progressed so did the technology powering these consoles. In the late seventies, the first game systems came out on which the games could be changed using physical media in the

form of cartridges. In the decades that would follow the media on which the games/software were distributed would change from cartridge to CD, DVD, Blu-Ray, and flash memory cartridges. In the mid-2000's the use of the internet became much more widespread in the Western world. This opened the door to new methods of distribution such as downloads directly to the game system/console, which became a popular method of consumption by consumers. Some companies report their game sales as being up to 50% digital (Dring, 2022). The market has also seen considerable growth over this period. It is estimated to grow 8,49% annually between 2023-2027, with a projected market volume of 250 billion US Dollars (Statista, 2022).

In recent years a new method of distribution has appeared in the form of cloud gaming which has remained small in comparison. The console industry is estimated to have a total scope of 48.95 billion USD in comparison to the 1.9 billion USD generated by the cloud gaming sector (Imacgroup, 2023; EMR, 2023). When also taking PC game downloads into account that leaves the market share of cloud gaming to be approximately 2,3%. This paper aims to shed light on the low adoption rate of the technology. Certainly, it is noteworthy that in such a large industry this modern method of consumption, which is now the standard for both film and music, has remained so small.

The market predominantly features the following three methods of consumption: through consoles with physical media, through consoles with digital downloads, through PCs with digital downloads, and through streaming with cloud gaming services. Consoles are dedicated gaming devices like the Nintendo Switch, PlayStation 5, or the Xbox Series X. These devices all give the user the option between downloading the games to the device or buying a physical copy at a store and inserting it into the console to play the game. Their main purpose is playing games, although some consoles also allow the user to download apps like Netflix. Players on a PC download their games onto their devices using launchers like STEAM or the Epic Games Store. Cloud gaming works by streaming the content/games over the internet and is the only option that currently does not allow the user to purchase and own individual pieces of software which can be done physically/digitally on other competing platforms. In Table 1 the various consumer purchasing methods discussed are presented in an overview per platform type.

**Table 1**
*Platfrom and content delivery in todays gaming landscape*

| Platform type | Method of content delivery | Product or service classification | Main market players |
|---|---|---|---|
| Console | Physical media containing the game. | Purchased game. | Nintendo, Sony, Microsoft. |
| Console | Digitally downloaded to the device. | Purchased game. | Nintendo, Sony, Microsoft. |
| Console | Digitally downloaded to the device. | Access to games through servitization. | Microsoft (Game pass). |
| PC | Digitally downloaded to the device. | Access to games through servitization. | Microsoft (Game pass). |
| PC | Digitally downloaded to the device. | Purchased game. | Valve, Epic-Games, Microsoft. |
| Cloud streaming | Streamed over the internet. | Access to games through servitization. | Microsoft, NVIDIA, Sony, Amazon. |

## 1.2 The cloud gaming concept and its applications

Cloud gaming is the act of playing video games without the need for a physical box that does the computing work. Instead, a computer in a nearby data center will render the game's graphics and stream this over the internet. This eliminates the need for the user to purchase a PC/console, as they only need a controller, screen, and access to the internet (Roach & Parrish, 2021). Older defunct services like Google Stadia required the use of a client device/dongle, but modern services have eliminated that need.

Each method alternative in the market (Console, PC, Cloud) has its advantages and disadvantages for the end user (Gurwin, 2019). Consoles offer the user less freedom over what they are allowed to use/purchase on the device because it is an enclosed ecosystem, much like how Apple can fully dictate what is compatible with iPhones when compared to Android. Personal computers are more customizable, but no longer get physical media releases for the vast majority of games that come out. Cloud gaming's main advantage is that there is no need to

purchase hardware and individual games separately, as it is all part of the subscription model. The main drawback here though is that its functionality is fully dependent on having a constant and stable internet connection. The consumer also does not own any of the games that he or she plays (Milton, 2020). In Table 2 the main advantages and disadvantages of each market option are highlighted.

**Table 2**
*Advantages and disadvantages of each platform*

| Platform | Business model | Content delivery | Main advantages | Main disadvantages |
|---|---|---|---|---|
| Console | Mostly product oriented* | Physical media & digital downloads | Easy to use, not fully dependent on the internet to function. | Closed environment. One company owns the entire platform which means the user has little control. |
| PC | Product oriented. | Digital downloads** | High degree of customization possible due to being an open platform. | All digital and steeper learning curve. ** |
| Cloud streaming | Service oriented | Streaming | Relatively cheap and highly versatile as it can be used on many devices. | Fully dependent on high-speed internet access and no ownership over software. |

**It is possible to get a subscription on most consoles, but this is mostly for online play.*
***There are still a few games that come to PC on DVD, but there are so few that it has no market relevance.*

# 2. Theoretical framework

In the theoretical framework, the dependent and independent variables making up this research into the low consumer adoption of cloud gaming services will be defined, explained, and related to the context of this paper.

## 2.1 Willingness to pay

The willingness to pay refers to the amount of money a consumer is willing to spend on a product and/or service. It is also an indicator of how much the consumer values the product/service's utility or the level of enjoyment they experience from their purchase (Schmidt & Bijmolt, 2019). This specific variable was chosen as the independent variable of this research paper because a high or low willingness to pay for a product and/or service by the selected demographic, in combination with the

selected independent variables, might help explain why the adoption rate of cloud gaming services is so low.

The willingness to pay for products and services is influenced by factors such as value perception. The more highly the value of an item/service is perceived the higher the willingness of the consumer to pay (Demirgüneş, 2015). Another variable that affects the willingness to pay would be the psychological sense of ownership. Bagga et al. (2018) researched how the psychological sense of ownership affected the willingness of consumers to pay. It was concluded that when the sense of ownership is diminished, such as with rentals instead of product purchases, the willingness to pay also decreases.

A widespread lack of willingness to pay in the consumer market will lead to low overall adoption rates. Adoption rates refer to what percentage of the market has bought into a service or product in relation to the total amount of users in the defined market. Adoption rates can be a good indicator of the overall popularity and commercial success of a company's offerings, although the speed by which this market share is reached is also very important, as this could be a sign of innovation in a changing market (Olshevsky 1971).

The market for cloud gaming has remained small in comparison to the traditional consoles offered by Nintendo, Xbox, and PlayStation. The console industry is estimated to have a total scope of 48.95 billion USD, in comparison to the 1.43 billion USD generated by the cloud gaming sector (IMACGROUP, 2023; EMR, 2023). When also taking the PC sector into account, which is valued at 29.35 billion USD, the overall market share of cloud gaming in comparison to the traditional platforms only reaches 2.3%. As it relates to the willingness to pay for cloud gaming services by the consumer base as a whole, it can be interpreted as being low.

## 2.2 Digital value perception

The concept of value perception refers to how customers perceive the value that they derive from a product and/or service when compared to the cost or expenditure. As the name implies the perception of value is key, not the literal monetary value (Boksberger & Melsen, 2011).

The value proposition of this innovative technology is to increase the availability and access to players by forgoing the steep monetary barrier of entry that

is the cost of the console. Various monetization models have been attempted to increase overall market share. At first, Google attempted to take a more traditional approach, selling individual pieces of software in their in-browser application for users to purchase individually and play (Grunin & Gonzalez, 2020). This approach raised serious concerns with consumers, as the games were priced as high as their physical counterparts on console competitors Xbox, PlayStation, and Nintendo. The literature shows that most individuals do not tend to value digital goods as highly as they do physical goods (Atasoy & Morewedge, 2018). Reasons for this include a lack of sense of ownership and perceived control, which the authors conclude to have a moderating effect on the relationship between digital value perception and the consumer's willingness to buy digital goods. This mismatch in market expectations and the offering of Google resulted in overall low traction and heavy upkeep costs, causing the venture to shut down in early 2023 (Gerken, 2023).

Microsoft took a different approach in monetizing their cloud gaming platform *''X-cloud''* by offering users a servitization-based model. Servitization is known as the transition from selling physical goods, to selling a service that achieves the same end goal for the consumer, in this case, entertainment through interactive media (Kohtamäki et al., 2019). For a monthly subscription, players could enjoy a variety of software through cloud streaming. This approach worked better due to a multitude of factors: firstly, the advantage of being an already established brand in an industry cannot be understated. The first thing prospective new consumers will notice about a product is whether or not they recognize the brand and whether or not they already have experience with it. If the brand is recognized consumers will identify the product and/or service as being a less risky investment than a competing alternative offered by unknown competitors (Moisescu, 2009). Secondly, the servitization-only nature of the offering makes for a more cohesive value proposition that this is indeed a service that is being provided, not a product being sold. Microsoft was able to communicate its value proposition more convincingly by making this distinction clear with its comparatively more affordable monthly subscription model (Martin et al., 2019). This has resulted in Microsoft becoming the industry leader in the cloud gaming market, having a total share of between 60-70% and becoming the only real viable option for consumers after Google dropped out of the market after the failure of its Stadia platform (Wituschek, 2023).

The understanding that consumers value digital goods less than physical goods is not necessarily a negative one if the business alters its business model accordingly. According to Nagle & Müller (2018), digital goods sellers and service providers need to factor in the lower perceived value of digital goods in their overall monetization strategy. One proposed way by the authors to achieve this is by lowering the overall barrier of entry by having a low *''lock-in''* price to entice new users and focusing on achieving high retention rates to realize a continuous revenue stream. This could be done by allowing for increased personalization of the sold digital good, or by making it more exclusive to the seller. In the context of video and cloud gaming, this could take the form of giving the player more control over the game data/settings (maybe even offering a download/purchase option for those that have local hardware) and having exclusive games be developed for streaming services that cannot be played elsewhere. It is thus hypothesized that when digital value perception increases, so does the willingness to pay for cloud gaming services.

- ***H1****: ''Digital value perception is positively associated with the willingness to pay for cloud gaming services.''*

## 2.3 Sense of ownership

A sense of ownership is defined as the feeling as if the purchased item/product is fully yours and that you are the only one who can decide when, why, and how to use it (Li & Atkinson, 2020). The sense of ownership also relates more so to the psychological feeling of ownership over a product or service rather than the legal state of product ownership. The psychological sense of ownership is described as coming from a place of identification (Pierce et al., 2003). People generally like to own things because it either makes them feel a certain way about themselves, and their status or use it as a way to express who they are to the outside world. A study by Allen and Ng (1999) explored a similar concept, as they explored the concept of consumers claiming more ownership over products of brands that hold similar core values as they did, highlighting how identification is closely related to the feeling and sense of ownership over certain products. Because this feeling of ownership over something is so strong, taking this feeling away from, for example, a product can result in a strong emotional response. Reducing or *''threatening''* a consumer's existing sense of psychological ownership over a product or brand identity can lead to a *''territorial response''* (Kirk et al., 2017). When consumers feel like their sense of

ownership over a product is being threatened, in this context often a company that tries to increase its control over an offered product or service, the consumer will respond defensively by lashing out against the entity to protect their perceived ownership over the product. This can be observed with cloud gaming services as well, as there has been a lot of push-back against cloud gaming services for their increased control over the games they host, as the user can't locally store or preserve it and is fully dependent on the service provide for allowing access (Hussain, 2023).

The other side of psychological ownership is how it can positively impact consumer behavior towards a brand, product, or service when it is respected and acknowledged as an important variable in product adoption. In a study by Jami et al. (2020), it was concluded that the sense of ownership improved positive behavior in individuals and made them display more pro-social behavior. This positivity could be harnessed in framing the brand as a pro-consumer and thus have a positive effect on the intention to buy when the sense of ownership is present. This has been known to work in the past, as consumers who have a higher sense of psychological ownership are generally more loyal to the company or organization providing them. This is because the sense of ownership creates a sense of connection and commitment to the organization, which is extremely beneficial for building and improving the customer's lifetime value to the organization, as they are far more likely to continue business with the company in question (Peck & Shu, 2018). This underlines the value of perceived ownership for long-term business viability and highlights the need for cloud gaming service providers to focus more on increasing the sense of ownership perceived by their customers.

Based on these findings it can be concluded that the sense of ownership is a valuable asset in garnering brand loyalty and customer satisfaction. It is thus hypothesized that when the sense of ownership goes up, so does the willingness to pay for cloud gaming services.

- ***H2****: ''The sense of ownership is positively associated with the willingness to pay for cloud gaming services.''*

## 2.4 Consumer habits

Consumer habits can be defined as consumption patterns that have been ingrained in certain markets and have persisted over a long period, which in turn can breed ignorance of emerging consumption alternatives (Pollak, 1970). Throughout videogame (console) history consumers have been conditioned to consume the gaming media in a certain way, as the software and accompanying game machine were always present in the player's living room (Kim & Lee, 2021). This phenomenon is known as consumer habituation (Wood & Neal, 2009).

Kleijnen et al. (2009) identified two main hurdles innovative technologies face when facing pre-existing consumer habits. The first is the amount of change the consumers would have to make in their acquisition and use of the product. The more change is required from the norm the more resistance the product would face. In the context of cloud gaming, this could be seen as quite a dramatic change. The consumer would have to shift from buying the console from the store and buying individual pieces of software to a fully servitized model where you only have to get the controller and subscription to a cloud gaming service. As far as the act of actually engaging with the game is concerned there is a less noticeable difference, as the games would be mostly the same experience across platforms. Although cloud gaming does have a much larger dependency on a constant high-speed internet connection to be seen as comparable. The consumer habits in this context are thus more so related to the purchasing and consumption method, as this is the largest difference in cloud gaming compared to console/PC gaming.

The second hurdle described by Kleijnen et al. (2009) relates to conflicts with the prior belief structure of the consumers. If the market innovation goes against the existing habits and beliefs of its consumers this could lead to major opposition and even rejection. This could be seen as one of the main reasons why the market has, so far, seemingly rejected the introduction of cloud gaming as a comparable/equal player in the video game platform market. Consumers have never had so little control over the games they played as they do when engaging with the software through cloud gaming services. Consumers do not own the games they are playing and do not have the game files locally stored as they do on consoles or PCs. They are also fully dependent on the company that provides the service to continue their support to continuously have access to the games players are emotionally attached to. This is in

stark contrast with the customer belief structure of many dedicated game fans: that games should be fully owned and accessible once paid for.

When introducing a product or service into the market that strays from the existing consumer habits two methods are described in the literature: downstream and upstream habit change (Kenny & Hastings, 2011). Downstream entails intensely promoting and informing prospective customers of the benefits and features of a service/product to convince them while they are in their orienting phase in the customer journey, which in this scenario would be in the transition from an older console to a new gaming device (Lemon & Verhoef, 2016). Upstream habit change is more so focused on changing the market/environment in which the customer finds themselves to prevent new customers from adopting the same existing habits possessed by older generations (Verplanken & Wood, 2006). This can be done by cloud gaming service providers investing more in marketing their offerings and increasing awareness and by doing research consumer research as the authors indicate.

The acceptance of a new method of content delivery/game consumption has already happened in the past in the console space, as console manufacturers were able to partially transition the market to a state where both physical games and games bought through digital distribution (downloads) can co-exist. Changing the market environments to be more suitable for cloud gaming technology in combination with the ever-increasing internet speeds around the globe might eventually reach a point where the cloud gaming sector could increase its market share substantially.

These existing consumer habits have an impact on whether or not the technology adoption is postponed, opposed, or outright rejected by the market. Research by Talwar et al. (2020) highlighted that when it comes to digital innovations, such as cloud gaming, the limitations are not only psychological but also functional. Meaning that some people simply do not have access to the tools necessary to use the introduced digital solution. In the context of cloud gaming, these obstacles could be identified as the lack of internet access or simply not being adept enough at navigating a completely digital environment, as was also brought to light by the book *''Digital Divide''* by Jan van Dijk (2023). As Talwar et al. (2020) mentioned: there needs to be more research done on the unique cases of consumer

habituation affecting digital-only innovations, as there are many more challenges that set it apart from traditional, product-oriented innovations.

Lee and Kim (2023) found that consumer habits can function as a moderator variable between the sense of ownership and the consumers' intention to purchase a product/service. If existing consumer habits are already in line with a newly introduced product this will strengthen their sense of ownership over their product, if it goes against it the opposite effect in the form of rejection might be observed.

In the context of this industry, this moderator effect can be described as follows: the sense of ownership has a positive effect on the willingness to pay, but due to existing consumer habits (owning the software either physically or downloaded) going against cloud streaming this will worsen their sense of ownership and thus intention to pay more so than in other industries where consumer habits have shifted towards a more accepting consumer base. Based on the market research and the cited literature the following hypothesis was constructed:

- ***H3***: *''Consumer habits are negatively associated with the relationship between a consumer's sense of ownership and their willingness to pay.''*

## 2.5 Perceived control

This variable can be defined as giving the consumer the sense that they are a part of the value-creation process (Guo et al., 2015). This means that the consumer must feel involved in deriving value from their purchase and thus feel in control. Perceived control, as the name implies, does not directly correlate with giving the user/consumer more direct control over the product and/or service for which they pay. Perceived control is about giving the user a sense of being in control over their purchase (Godek, 2005). According to Sieger and Detjen (2021), the effect of perceived control is influenced by four key factors. The first of which: the product/service has to be effective and efficient in achieving its core task. If the solution offered is not smooth in its daily use the user might feel as if there is something they do not understand working against them, which they have no control over.

The second dimension relates to the understandability of the solution, it needs to be understandable enough to be operated by the average consumer to increase their sense of control. The offered solution also needs to be stable and reliable, as

frequent crashes and errors/bugs will frustrate the user and make them feel as if they are not in control, regardless of the problem being user error. It was also found by the authors that increasing settings and presentation (screensaver, UI, font, etc.) customizability also increases the sense of control over the provided service/Product. Lastly, there are the insights the company behind the service or product provides when it comes to privacy concerns. The more transparency the company provides regarding this concern, the higher the sense of perceived control of the end user. It was found that providing this information had a positive effect on perceived control and trust, but when consumers read through the privacy policy the effect was inconclusive. Indicating that providing the information is enough of a motivator (Arcand et al., 2007). To further increase the perceived control of users of cloud gaming services companies could invest more care and attention into transparency and openness to instill trust in the consumer, as Arcand (2007) highlighted, providing the information and having an open corporate attitude towards the consumer is responsible for the positive emotional response, not the actual contents.

The literature supports that these dimensions do not all have a one-way effect on the dependent dimension. For instance, Putra et al., (2022) found evidence that when an individual has a heightened sense of perceived control over their digital purchase would increase their willingness to purchase the digital product and/or service. This could be indicative of perceived control serving as a positive moderator variable between the negative relationship between digital value perception and the intention to buy cloud gaming service subscriptions.

Based on these findings the following hypothesis is constructed, with perceived control acting as a moderating variable between digital value perception and the consumer's willingness to pay for a cloud gaming subscription:

- ***H4***: *''Perceived control is positively associated with the relationship between a consumer's digital value perception and their willingness to pay."*

## 2.6 Control variables

Due to the nature of cloud gaming technology a stable and high-speed internet connection is required to enjoy it to the fullest. This paper focuses on the consumer psychological reasons that have an influence on the willingness to pay for cloud gaming services rather than the technological reasons. However, users' poor internet

access may indeed lead to negative perceptions of internet services (Bouraqia et al., 2020). For this reason, *''self-described internet reliability''* will serve as a control variable. These factors might also be a cause of the low adoption rate of the technology. As is described in the book of van Dijk (2020). Even in Western markets such as Europe and North America, there are large groups of individuals who do not have fast and reliable enough access to the internet to facilitate cloud gaming. This is especially true considering that in order to host an experience comparable to home gaming systems the technology requires both relatively fast download and upload speeds (Corden, 2022). Even in developed countries relatively remote towns and neighborhoods do not normally have access to such connections, limiting the potential customer base. This paper aims to research the consumer psychological aspect and the willingness to pay for cloud gaming services. It can however not be ignored that some people might experience technological limitations, such as bad or unreliable access to the internet. It is thus important to control for these factors.

In addition to the internet speeds and stability the following control variables were used; age, gender, prior cloud gaming experience, familiarity with Xcloud, and familiarity with Google Stadia.

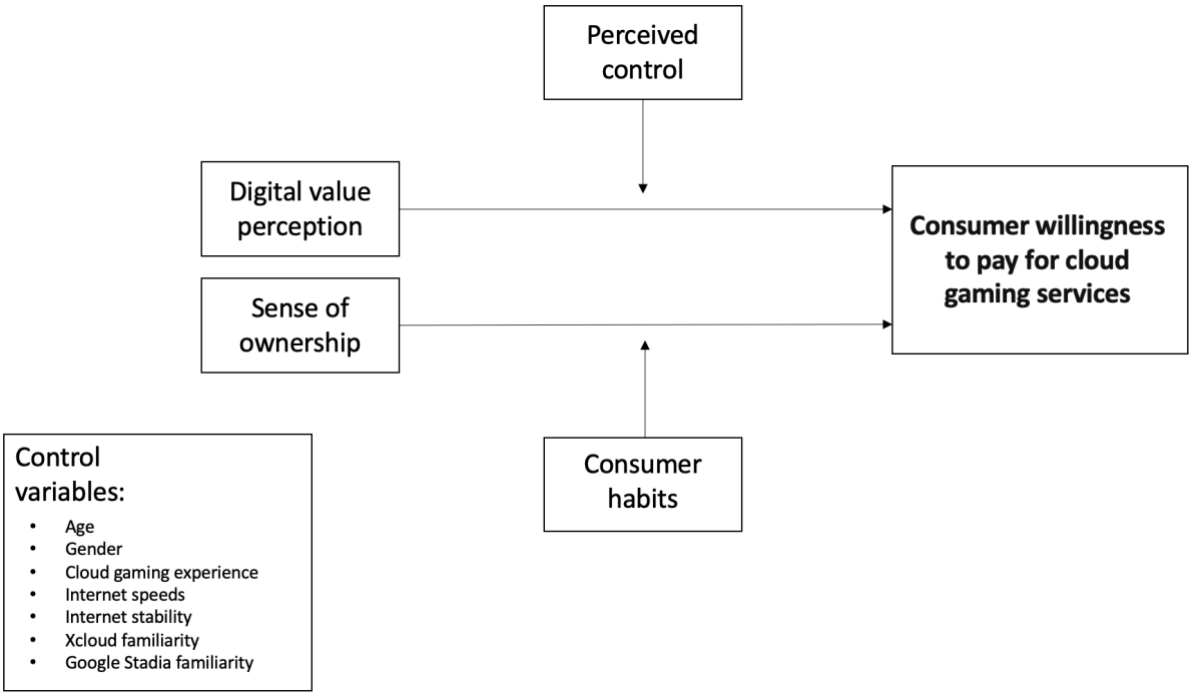
## 2.7 Conceptual model

This paper will predominantly focus on how the dimensions of digital value perception, the sense of ownership, existing consumer habits, and perceived control influence the willingness to pay for cloud gaming services. The research question which this paper aims to answer reads as follows:

> *''In what ways do digital value perception and sense of ownership relate to the willingness to pay for cloud gaming offerings?''*

These independent dimensions are hypothesized to have a relation with the dependent variable: willingness to pay. The model implements both perceived control and consumer habits as moderator variables. The conceptual model aims to discover the effect and potential relationship between the dimensions and the willingness to pay for cloud gaming services.

**Figure 1:**
*The conceptual model showcases the dimensions that relate to the willingness to pay.*




In Figure 1 the relationship between the variables is given form. Digital value perception has a negative effect on the willingness to pay, moderated by the amount of perceived control by the consumer. It is hypothesized that if this value is high it improves the relationship. The sense of ownership is hypothesized to have a positive relation to the willingness to pay, which is potentially worsened depending on the pre-existing consumer habits.

# 3. Method and research design

## 3.1 Research design and measures

The research design for this paper took the form of a cross-sectional survey that utilized seven-point Likert scales to measure each of the previously described variables. The survey also contained questions relating to the internet speed and stability of the user's network, as well as questions about the respondents' demographical information such as age, gender, preferred language (English/Dutch), and their country of residence. The survey also included three open questions about the participants' current perspective of cloud gaming services, their most desired features, and what they believe to be the biggest improvement area of current

offerings. O'Cathain and Thomas (2004) concluded that including open-ended questions in a multiple-choice survey increases the amount of context that can be derived from your group of participants. Participants will gain the opportunity to elaborate responses to closed questions and allow researchers to identify new issues not thought of beforehand, which in turn could be useful for identifying future challenges for other researchers. For this reason, the three open-ended questions were included in the data collection method of this research paper. The open questions are thus not necessarily meant to support or disprove the hypothesis presented in this paper, as they do not directly relate to the variables in question but are instead meant to identify areas and variables that were not thought of or included in the theoretical model of this paper.

To measure each variable, pre-existing validified measurement scales were used for the research and survey design. These scales were altered to fit the context of this research paper and thus have their phrasing slightly altered to accommodate for this change.

### Willingness to pay measurement scale

The dependent variable of *''willingness to pay"* was measured using an existing scale developed by Ye et al. (2004). The researchers conducted a study in which they measured the willingness to pay for online services. They examined areas such as entertainment, information providers, and sports broadcasting. To measure the willingness to pay for these online services the researchers used a 5-point Likert scale to measure the variable. Because this scale was developed to measure the willingness to pay for online services across many different applications the phrasing of the items has been altered slightly to be more in line with the context of this study. The 5-point Likert scale was also changed into a seven-point Likert scale instead to prevent participant confusion by presenting every scale in the same measurement style. The recontextualized scale's items read as follows:

1. *If I frequently use an online service, I prefer to pay for it over the ad-supported tier.*
2. *I am willing to pay for online entertainment.*
3. *I am willing to use internet banking for online subscriptions.*

4. *If the service gives me a higher quality experience while paying, I would subscribe.*
5. *I am willing to pay for video games.*

### Digital value perception measurement scale

To measure digital value perception during the survey the multidisciplinary scale by Chowdhury and Abe (2002) was used. Their scale consists of a maximum of twenty potentially usable items, all measured on 7-point Likert scales. The scale passed the examination of its reliability and validity by testing it over a long period, changing the wording used, changing the market in which it was tested, and reducing the number of items the participant was required to fill in. The recontextualized scale's items read as follows:

1. *I think cloud gaming services are worth the subscription fee.*
2. *Cloud gaming services will offer good long-term value.*
3. *I think cloud gaming services are going to last long into the future.*
4. *I think cloud gaming services outperform alternatives.*
5. *I feel the need to look up additional information before paying for cloud gaming services.*

### Sense of ownership measurement scale

The sense of ownership is measured through an existing 7-point Likert scale developed by Han et al. (2015), which in turn is based on the scale developed by Van Dyne and Pierce (2004). The so-called *''sense of ownership scale''* the degree to which consumers feel like they have ownership over the product they have purchased. The scale has been tested by the researchers by examining its reliability and validity against other existing constructs and has been used without reliability and validity issues by other researchers. The recontextualized scale's items read as follows:

1. *When I scroll through a digital library, I get the sense that the content is mine.*
2. *I feel like the digital entertainment I consume through services are my own.*
3. *I feel like the media I can consume through digital services reflects me.*

4. *I feel like the media I consume through digital services are a part of my identity.*

### Consumer habits measurement scale

To measure and evaluate the consumer habits dimension of this research paper the scale developed by Walsh et al. (2007) was used and adapted for this paper. The consumer habit proneness/confusion scale aims to measure habitual behavior among consumers in a variety of markets. The scale has been tested for consistency, reliability, and validity using a sample size of 264 participants. The scale, like the others, follows a 7-point Likert scale format. The recontextualized scale's items read as follows:

1. *I often buy games on the same platform.*
2. *I have a favorite brand from which I purchase most games.*
3. *I usually buy games through the same type of consumption method (Physical, download, cloud).*
4. *I often play my games from the same media format (Physical, download, cloud).*
5. *I usually buy the same type of games.*

### Perceived control measurement scale

To measure the perceived control consumers feel they have over cloud gaming solutions the 7-point Likert scale developed by Ajzen (2020) was used and recontextualized for this context. The scale developed by Ajzen (2020) is focused on analyzing the sense of perceived control over new and up-and-coming technologies. The scale was partially developed by implanting certain elements of the theory of planned behavior by the same author (Ajzen, 1991). The scale has been tested for reliability, validity, and internal consistency. The recontextualized scale's items read as follows:

1. *I would feel in control over a cloud gaming service.*
2. *I feel like I would have a say in how I use cloud gaming services.*
3. *I feel like I could influence the performance of cloud gaming.*
4. *I feel like I am informed enough to use cloud gaming.*

5. *I feel like I would have chosen the best option for me when using cloud gaming.*

The scales used for each dimension of this research paper's data collection can also be found below in the overview presented in Table 3.

**Table 3**
*Operationalization of the research variables*

| Variable | Definition | Measurement | Survey Scale | Source |
|---|---|---|---|---|
| The willingness to pay | To what extent are the consumers willing to pay for cloud gaming services. | Fee based online services scale. | 7-point Likert scale from fully disagree to fully agree. | Ye et al. (2004) |
| Digital value perception | How do consumers perceive the value of digital goods. | Consumer perception of value scale. | 7-point Likert scale from fully disagree to fully agree. | Chowdhury and Abe (2002) |
| Sense of ownership | To what degree do consumers feel like they own the product or media. | Sense of ownership scale. | 7-point Likert scale from fully disagree to fully agree. | Han et al. (2015) |
| Consumer habits | To what extent do consumers express habituative behavior while purchasing and using goods or services. | The consumer habit proneness/confusion scale. | 7-point Likert scale from fully disagree to fully agree. | Walsh et al. (2007) |
| Perceived control | How much control do consumers feel like they have over their purchase. | Scale for assessing consumer's perception of value for electronic products | 7-point Likert scale from fully disagree to fully agree. | Ajzen (2020) |

### Control variables

To check for potential poor internet speeds or lack of access the *''self-described internet speeds''* scale was introduced. This variable made it possible to

control for this factor influencing the results of the items of the other variables. This variable was measured using the scale used by Qiumeng and Shen (2022) originally meant to measure the ease of new media information transmission to the public. The scale is a one-item 5-point Likert scale that uses the terms '*'very slow and unstable"* to '*'very fast and stable"* to measure the participant's self-described internet speeds. This scale was measured on a seven-point Likert scale rather than the original 5-point used in order to be uniform with the other scale items in the survey. Other than this one change the item was left unaltered, as it was already suitable for the context of cloud gaming. In addition to internet speeds internet stability, age, gender, and prior cloud gaming experience/familiarity also served as control variables.

### Open questions' first-order codebook

To be able to analyze the open-ended questions presented at the end of the survey a codebook was constructed. The first-order codes are based on common themes observed throughout the responses. All of the codes/labels used for the three open questions can be found below in Table 4.

**Table 4**
*Code book used for the analysis of the open questions.*

| Codes open question #1* | Codes open question #2** | Codes open question #3*** |
|---|---|---|
| Accessibility praise | Better game performance | Cross platform interaction |
| Seen as an alternative | Bigger selection of software | Ease of use |
| Big selection of software | Cloud storage | Features |
| Future of the industry | Ease of accessibility | Game library |
| Internet dependency concerns | Longevity | Monetization format |
| No downloads praise | Optional ownership | More information |
| Ownership concerns | Security | Offline functionality |
| Performance concerns | Sharing options | Ownership options |
| Stability concerns | Value for money | Price reduction |
| Subscription model concerns | | Technical performance |
| Waste reduction praise | | UI improvements |

** How do you generally feel about cloud gaming?*

*** What are the most important features that you look for in a cloud gaming service?*
**** What (If anything) would you improve about cloud gaming services?*

## 3.2 Data collection and survey distribution

The survey was distributed through two main channels, through the method of snowball sampling. A non-probability sampling method that encourages participants to spread the survey amongst their family, friends, and peers (Parker et al., 2020). It is often used to get a relatively large sample size in a relatively short amount of time. In addition to this first distribution method, the survey was also shared on both the Instagram and Facebook pages of a Dutch retailer that specializes in the sale of games, consoles, accessories, and video game merchandise for additional respondents. To incentivize respondents to complete the survey the option to receive the results of the survey and to enroll in a giveaway were presented to the participants. The potential price was two gift cards for the participating retailer's store.

## 3.3 Population demographics

As of the most recent reliable market information the majority of console players are located in Europe followed by the United States and Japan (Statista, 2023a; Statista, 2023b; GlobalData, 2022). The average age group is reported to be between 20-39 with a long tail reaching into the older age groups, as based on North American statistics (Statista, 2023c). Information about the gender split of this market is hard to find because mobile games are often included in the demographical data describing the market. As this paper aims to focus on the willingness to pay and the reasons that prevent players from adopting a cloud-based alternative to the PC and console platforms the data regarding gender identity was collected due to the incompleteness of existing data.

## 3.4 Framing and briefing

The research was introduced to the participants as a master thesis conducted on behalf of the University of Twente into the acceptance of cloud gaming services. Participants were informed that none of the data collected during the filling out of the survey could be traced back to an individual. Consent to record and analyze the results of the survey was explained to the participant. They were also informed that they could stop the survey at any time and that they could withdraw consent at any time during the filling-in process. To prevent the survey responses from being traceable to the giveaway enrollment a separate survey was made.

## 3.5 Participants and ethical concerns

The data collection method involved collecting answers from participants who were asked for consent, in line with the standards established by the BMS faculty (Universiteit Twente, 2023). Participants who did not agree to the terms were subsequently sent to the end of the survey without their responses being recorded.

## 3.6 Survey procedure

The dependent variable was always measured before the other variables. The survey questions relating to the independent and moderating variables were randomized for each participant. The closing fill-in questions always closed the survey before thanking the participants for their time and effort spent on filling out the survey. The inter-scale items were not randomized and were presented to all of the participants in the same order. For a more detailed overview of the presentation of the survey and its flow, please take a look at Appendix 8. By default, the survey started up I English, there is also a Dutch translation available, as can be seen in Appendix 9. This is selectable on the first page of the survey.

# 4. Results

In total, the survey was filled in/started by 1004 participants. After having removed the participants who did not fully complete the survey as well as participants who filled in the survey in an impossibly fast timespan, 722 completed survey responses were used in the data analysis that is presented in this section of the research paper.

## 4.1 Demographic data and results

As can be seen in appendix one the distribution of the respondents' age was skewed towards the younger side, with the majority of the 722 participants being between the ages of 18 and 36.

When examining the country of residence of the participants as well as the language in which they chose to complete the survey in appendix two and three we can see that the vast majority of the participants reside in the Netherlands (98.6%), with the remainder living in Germany (1.4%). The language used to complete the survey was a Dutch majority of 82.5% while 17.5% chose to complete the survey in English.

When it comes to gender identity distribution, it was noted in appendix four that the majority of the participants identified themselves as male, with 62%. Female was the second most common identification with 34%. Non-binary made up 3% of all respondents while 1% chose other or preferred not to share this information for this research.

In appendix five we can see that the mean time it took the 722 participants to complete the survey was 596.70 seconds or a little over nine minutes. This statistic is on the high end of the spectrum due to the survey distribution program used for this survey also counting the lapsed time in between responses to the overall time it took a participant to complete the survey. Therefore, the median duration time is the better indicator for the average response time at 402 seconds or 6.7 minutes.

## 4.2 Background information

**Table 5**
*Cloud gaming familiarity*

| | Frequency | Percent |
|---|---|---|
| I have heard about it before, but I am not entirely familiar with it | 196 | 27.1 |

| | | |
|---|---|---|
| No, I am not familiar with cloud gaming services | 86 | 11.9 |
| Yes, I am familiar with the concept | 440 | 60.9 |

One of the questions presented to the participants before the variables were measured was their knowledge of cloud gaming as a concept. Given the fact that the sample largely consisted of people who have some level of affinity with video games, the respondents were quite familiar with the research topic. 60.9% of people indicated that they were familiar with the topic, with an additional 27.9% saying they had heard about it before but were not entirely familiar with the technology. Lastly, 11.9% did not know what the technology entailed.

Participants were asked to rank both their internet speed and the reliability of their home internet network. As the graphs in appendix six show, the large majority of people rank their home network's speed and reliability as being above average to great. Meaning that the internet speed should not be the main bottleneck for people's perception and/or experience of cloud gaming's performance.

## 4.3 Descriptive statistics

When examining each statement used to measure willingness to pay, which can be found in appendix seven, items one through four show similar means. However, item five has both a much higher mean score on the seven-point Likert scale and a substantially smaller standard deviation when compared to the other items. Item five contained the statement *"I am willing to pay for video games".* The other statements focused more on the willingness to pay for entertainment, online services, and higher-quality experiences.

Digital value perception is one of the two dependent variables presented in this paper. This variable has larger deviations between the items when compared to the descriptive results of the other descriptive outputs. Item 3 *"I think cloud gaming services outperform alternatives".* Scored quite high with an average mean of 5.12 on the seven-point scale. Item five, *"I feel the need to look up additional information before paying for cloud gaming services"*, was reverse coded as an agreement with this statement would indicate a lack of trust in the service and the users' capabilities in operating it. Most users tended to agree with this statement, thus explaining the low score seen.

The means of the sense of ownership all averaged below the neutral score of four, with the exception of statement number four*: "I feel like the media I consume through digital services are a part of my identity."* Which averaged 4.24 on a seven-point scale. Although all sense of ownership items specifically mentioned digital services and libraries the latter two focused on the participants still relating and identifying with the contents of such services. Both of these statements scored higher.

The variable *"consumer habits"* was hypothesized to have a moderating effect on the relationship between the sense of ownership and the willingness to pay for cloud gaming services. The mean statistics for all of the items are all (well) above neutral, showing the presence of consumer habituation based on the statements presented to the participants. The standard deviations of the items used are also quite comparable to one another.

The items used to measure their sense of perceived control over cloud gaming services indicated that participants tended to have a lower sense of perceived control, with items one, two, three, and five being below the neutral value of four. The one exception is statement number four: *"I feel like I am informed enough to use cloud gaming".* For the content and phrasing used for each individual statement, please look at section 3.1 *"Research design and measures".*

## 4.4 Scale reliability

**Table 6**
*Scale reliability*

| Scale | Cronbach's Alpha | N of Items |
|---|---|---|
| Willingness to pay | 0.753 | 5 |
| Digital value perception | 0.614 | 5 |
| Sense of ownership | 0.781 | 4 |
| Consumer habits | 0.708 | 5 |
| Perceived control | 0.748 | 5 |

To test the reliability of the scales used to measure each variable presented in this research paper a reliability test using Cronbach's alpha was performed. A Cronbach's alpha value above *(α=.60)* tends to be acceptable while values higher than *(α=.70)* are considered good. Values of *(α=.90)*, or higher might raise suspicions as then there might be some degree of redundancy present in the statements used to measure each variable (Barbera et al., 2020). The reliability of the scale used to measure digital value perception is on the low side with a value of *(α=.614)*, while the other scales presented in Table 6 all perform well with their reliability being above (*α=.70*)

## 4.5 Correlations

*Table 7*
*Spearman's Rho correlations*

| Variables | Willingness to pay | Digital value perception | Sense of ownership | Consumer habits | Perceived control | Age | Gender | Cloud gaming experience | Internet speed | Internet stability | Xcloud experience | Google Stadia experience |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Willingness to pay | - | | | | | | | | | | | |
| Digital value perception | .199** | - | | | | | | | | | | |
| Sense of ownership | .210** | .368** | - | | | | | | | | | |
| Consumer habits | .186** | .028 | .125** | - | | | | | | | | |
| Perceived control | .212** | .576** | .445** | .057 | - | | | | | | | |
| Age | .012 | .076* | -.134** | -.006 | .028 | - | | | | | | |
| Gender | -.191** | .117** | .028 | -.013 | .035 | .046 | - | | | | | |
| Cloud gaming experience | .189** | -.090* | -.036 | -.022 | .039 | .032 | -.228** | - | | | | |
| Internet speed | .142** | -.020 | .005 | .023 | .048 | .112** | -.096* | .177** | - | | | |
| Internet stability | .153** | -.068 | .046 | .070 | .018 | .178** | -.126** | .146** | .632** | - | | |
| Xcloud familiarity | .205** | -.093* | -.027 | .058 | -.069 | -.028 | -.187** | .391** | .170** | .133** | - | |
| Google Stadia familiarity | .211** | -.256** | -.016 | .092* | -.161** | -.072 | -.296** | .267** | .132** | .131** | .397** | - |

***Correlation is significant at the 0.01 level (2-tailed).*

In Table 7 you will find the correlations of the variables presented in this paper. The table presents the correlations between the core variables of this paper in addition to several control variables. First, it is noted that there is a relatively strong positive correlation between the variables of digital value perception and the willingness to pay for cloud gaming services (.199**). In practice, this translates to individuals who perceive digital goods as being valuable and being more willing to pay for such products and/or services. The sense of ownership is also somewhat strongly positively correlated with both digital value perception (.368**) and the willingness to pay (.198**). This result could be indicative of a stronger sense of ownership enhancing the perceived value of goods/services and thus the willingness to spend money on cloud gaming services.

Age seems to be a factor. Older individuals tend to experience a lesser sense of ownership over their digital goods, with a strong statistically significant negative coefficient (-.134**). Meaning that as age goes up their sense of ownership goes down. As can be seen in Table 7 having prior cloud gaming experience is associated with higher user-reported internet speeds (.177**). This same correlation can be seen with people who have cited being familiar with the Google Stadia and Xcloud cloud gaming services.

## 4.6 Regression and ANOVA

**Table 8**
*Regression table*

| | 1- Controls | 2- Controls+IVS | 3- Controls+IV+Mod | 4- Controls+IV+Mod+Int |
|---|---|---|---|---|
| Constant | 4.83 (.222)*** | 3.462 (.264)*** | 2.521 (.303)*** | 2.059 (.680)*** |
| ***Independent variables*** | | | | |
| Digital Value Perception | - | .231 (.041)*** | .184 (.046)*** | .124 (.122) |
| Sense Of Ownership | - | .130 (.030)*** | .080 (.032)* | .323 (.135)+ |
| ***Moderation*** | | | | |
| Consumer Habits | - | - | .192 (.034)*** | .329 (0.098)*** |
| Perceived Control | - | - | .091 (.040)* | .017 (.119) |
| DVP***PC** | - | - | - | .118 (.029) |
| SoO***CH** | - | - | - | -.297 (0.025) |
| ***Control variables*** | | | | |
| Age | -.079 (.004)* | -.076 (.004)* | -.071 (.004)* | -.072 (.004)* |
| Gender | -.074 (.079) | .083 (.075)* | -.082 (.073)* | -.087 (0.074)* |
| Cloud Gaming Experience | .111 (.083)** | .114 (.089)*** | .115 (.077)*** | .114 (0.077)*** |
| Internet Speed | .053 (.039) | .042 (.037) | .048 (.036) | .047 (0.036) |
| Internet Stability | .077(.040) | .083 (.038) | .065 (.037) | .066 (0.037) |
| Xcloud familiarity | .071 (,084) | .070 (.079) | .066 (.077) | .065 (0.077) |
| Google Stadia Familiarity | .087 (.092)* | .149 (.089)*** | .136 (.088)*** | .131 (0.088)*** |
| **F-Change** | 9.739*** | 36.648*** | 18.570*** | 1.187 |
| **Adjusted R-Squared** | 8% | 16.5% | 20.5% | 20.6% |

****=p<0,001*

***=p<0,01*

**=p<0,05*

To get a better understanding of the relation between the variables presented in this research paper four separate linear regressions were performed, one with only the control variables, a second with the controls, and the two independent variables *''digital value perception''* and *''sense of ownership''*. The third regression adds the remaining two variables *''consumer habits''* and *''perceived control'',* but without them acting as moderators. Lastly, the fourth regression performed follows the theoretical model as presented in Figure 1, with the perceived control and consumer habits interaction effect being included in the regression.

When all variables are treated as independent variables, we can see that all variables have a significant effect on the dependent variable *''willingness to pay''*. In this model, the standardized coefficients all have a positive effect on the dependent variable.

The overall model has a statistically significant effect on the willingness to pay (*p<0.01*) and when examining the adjusted R-squared outcome, it can be concluded that in the theoretical model where all variables act as independent variables, the explained variance is 20.5%. Meaning that the independents explain 20.5% of the participant's willingness to pay for cloud gaming services.

Model 4 presented in Table 8 contains the linear regression of the variable's relation to the dependent variable of willingness to pay as was hypothesized in the theoretical framework and visualized in Figure 1. In the theoretical model, perceived control is a moderating variable between digital value perception and the willingness to pay for cloud gaming services. Consumer habits are also a moderating variable between the independent variable of sense of ownership and the willingness to pay for cloud gaming services. When incorporating these variables it can be observed that the independent variables besides consumer habits are no longer statistically significant predictors of the willingness to pay for cloud gaming services. The sense of ownership is almost statistically significant *(p=0.055).*

From the selection of control variables the predictors with statistical significance were age, gender, prior cloud gaming experience, and familiarity with the discontinued Google Stadia service. Age and gender had a negative effect on the willingness to pay, while prior cloud gaming experience and familiarity with Google Stadia had a positive effect on the dependent variable.

When examining the increase in explained variance across the four models by looking at the F-change we can see that the addition of the two interaction effects in model four does not significantly contribute to the model's adjusted R-squared result.

## 4.7 Results open questions

**Table 9**

*Open question one: General perception of cloud gaming services*

| | Frequency | Percent |
|---|---|---|
| Accessibility praise | 6 | 1.6 |
| Seen as an alternative | 126 | 34.2 |
| Big selection of software | 2 | .5 |
| Future of the industry | 30 | 8.2 |
| Internet dependency concerns | 25 | 6.8 |
| No downloads praise | 3 | .8 |
| Ownership concerns | 101 | 27.4 |
| Performance concerns | 48 | 13.0 |
| Stability concerns | 1 | .3 |
| Subscription concerns | 23 | 6.3 |
| Waste reduction praise | 2 | .3 |
| Total | 368 | 100 |

As the open questions were not a mandatory part of the survey 381 of the participants took the time to fill in one or more of the open questions. The first open question asked participants how they generally felt about cloud gaming services. The comments and answers left by the participants had common themes and were coded accordingly. The code book used to code the responses and make them able to be analyzed can be found in Table 4. In total, the first open questions were answered by a total of 368 participants. The most often coded response, with a frequency of 126, was the perceived value of cloud gaming services as an alternative to the current console and PC markets. Respondents cited that the innovation would be nice as a supplemental service they could use in tandem with the more traditional offerings. Potential use cases participants outlined were the use of cloud gaming services to try out a game before committing to purchasing and waiting for the download to finish and playing a game portably while out and about so that they can continue where they left off while playing at home on another platform such as console or PC. Many participants who saw it as an alternative did highlight the fact that they would not like it to be the mainstream or sole option for playing games.

Some examples from participants who saw cloud gaming as a supplemental alternative to traditional gaming platforms such as consoles and PCs:

- *''I don't prefer it to physical or actually owning the games digitally but if I am not sure if I will like a game then it's nice to try it out on game pass for example. It's a lower commitment threshold.''*
- *"It is a good concept and alternative, especially when someone doesn't have the hardware to play a game themselves. Personally, I wouldn't use cloud gaming to play a game that my own machine can handle. Additionally, it sounds like a nice option to use while traveling, provided the internet is good enough."*
- *''Very convenient in some cases, especially when you want to try out a game. However, I do see a risk in becoming entirely dependent on the internet and a stable connection.''*

There were also a lot of participants (101) who raised concerns related to the lack of ownership provided by cloud gaming services. These ranged from concerns about the preservation of the medium years into the future, concerns about the constant rotation of games being available ruining progress made in a game, and the lack of say consumers have in what they want to do with the software such as installing modifications (otherwise simply known as mods on the PC platform).

The following three statements are a sample from the comments left by participants relating to the concern of the lack of ownership over games played through cloud gaming services:

- *''I don't think it's for me. I like owning the games I play so I don't have to worry about them potentially disappearing in the future (which is the main reason I opt to buy my games, and buy them physical is at all possible)''*
- *''It sucks that games and access can be taken away at all times.''*
- *''I prefer keeping games physical or locally stored, I still want to own the games when my connection goes out or the cloud service disappears like Stadia.''*
- *''Personally, I'm still a bit wary of it because the content can change. You'll never truly own the games, and that's where the real value lies for me—collecting games is a hobby.''*

Another sizable group (48) of the participants brought up concerns relating to the performance of cloud gaming services. Performance refers to how games run while

operating on cloud-based streaming technology and the potential lag and ping impacting the enjoyment of playing the games.

- *''It's not meant for competitive games. Also, a no go for first person shooters or extremely precise games like crash bandicoot 4.''*
- *''Unreliable in terms of performance. A beautiful concept, but it needs optimization before becoming a serious option for me.''*
- *''Single player is great, but for multiplayer, especially PvP, there's too much input lag, which puts you at a disadvantage.''*

**Table 10**
*Open question two: Most desired features of cloud gaming services*

| | Frequency | Percent |
|---|---|---|
| Better game performance | 114 | 29.9 |
| Bigger selection of software | 83 | 21.8 |
| Cloud storage | 13 | 3.4 |
| Ease of accessibility | 85 | 22.3 |
| Longevity | 1 | .3 |
| Optional ownership | 20 | 5.2 |
| Security | 11 | 2.9 |
| Sharing options | 13 | 3.4 |
| Better value for money | 41 | 10.8 |
| Total | 381 | 100 |

The second open question presented to the participants received slightly more respondents than the first question with a total of 381 responses to the question *'' What are the most important features that you look for in a cloud gaming service?''* The most common comment code relating to features and experience was about the performance of cloud gaming services in comparison to existing market options such as console and PC gaming. Participants cited lag and stuttering of their gaming experience to be among the main reasons why they do not want to use cloud gaming services in the present day.

The following four statements provided by participants serve as a sample of what the respondents commented about the current technical performance of cloud gaming services:

- *''If I would require a cloud gaming service, the most important aspect would be latency, especially with multiplayer games. From cloud gaming services, I would expect nothing but the best settings (Ultra).''*
- *''Response time, I would be frustrated with all the delays.''*
- *''Reliability and the fact that it works quickly, allowing you to achieve similar functionality to that of a PC or console to some extent.''*
- *'' If I were to use cloud gaming all popular titles should be available at good resolution and FPS. Otherwise, the whole point is lost.''*

The second most important aspect of a pleasant cloud gaming experience (85), as per the participants of this survey, was the ease of access to cloud gaming platforms. Participants mentioned that cloud gaming services should always be easy to access on a multitude of devices and have quick boot-up times so that you can easily drop in and -out of the gaming experience provided by the services.

- *''Being able to play titles that are not normally available on my own equipment (e.g., MacBook) and playing wherever I want via my MacBook.''*
- *''Simplicity is key, allowing not only the younger generation but also older individuals interested in video games to navigate and enjoy cloud gaming.''*
- *''I want to be able to quickly find and launch games, and it should distinguish itself in that regard from other types of gaming services. It should feel as if the entire gaming world is at your fingertips, accessible wherever you are whether that's at home or, for example, on a train.''*
- *''The possibility of trying different games on platforms. And I can play whatever I want. At my house or by my bf.''*

83 participants mentioned the availability and the selections of game software to be their most important factor when considering cloud gaming services. Raising concerns relating to the constantly rotating selection of games in addition to the frustration of many big and popular games not currently being available on cloud gaming services. Participants also mentioned that some genres are underrepresented on most cloud gaming services. The following statements provided by participants will highlight and contextualize some of these concerns.

- *''More personalized offerings. Being able to customize what you play and adjust your library with similar games. Perhaps simply adding an 'add' button for the games.''*
- *''The inclusion of the latest games is important, but often that's not the case, or you have to wait for several months.''*
- *"Being able to choose what games I get to play. I would show less interest if it's quantity but show more interest if it's games, I can actually enjoy. So, games that the player is interested in."*
- *''An extensive library of games. Think of old games in this context. With PlayStation Plus Premium, you can also play very old games. For me, this would be an added value since it sets it apart from the rest.''*

**Table 11**
*Open question three: Most important improvement areas of cloud gaming services*

| | Frequency | Percent |
|---|---|---|
| Cross platform interaction | 13 | 5.1 |
| Ease of use | 1 | .4 |
| Features | 14 | 5.4 |
| Game library | 33 | 12.9 |
| Monetization format | 20 | 7.8 |
| More information | 17 | 6.6 |
| Offline functionality | 11 | 4.3 |
| Ownership options | 20 | 7.8 |
| Price reduction | 32 | 12.5 |
| Technical performance | 94 | 36.6 |
| UI | 2 | .8 |
| Total | 257 | 100 |

The third open question, '*'What (If anything) would you improve about cloud gaming services?''* asked participants about what aspects of cloud gaming services could see the most improvement. Being the last question of the survey, this question saw the fewest responses with a total number of 257 comments left, as can be seen in Table 11.

Technical performance was, by quite a wide margin, the most cited improvement area for participants to consider using cloud gaming services in the future with a total frequency of 94. The technical issues described by the participants are mostly about the lag that streaming introduces to the button presses by the user. Participants also

brought up concerns relating to the stability of the current cloud gaming offerings, having encountered instances where the connection was suddenly lost on the provider's end, causing the program to stop and forcing a reboot. The following statements explain the technical issues described further:

- *''The servers become quite unstable when too many people play simultaneously. For example, downloads get canceled, payment errors occur, or there's an extended wait for content to become available after payment."*
- *''Making single-player games more usable with less stable internet (allowing buffering to reduce game lag)."*
- *''I have used older versions of cloud gaming, specifically the version offered by Razer, and I was very dissatisfied. Latency and framerate were significant issues with their service, and I hope these can be improved."*
- '*''The ping between you and the server sometimes has a delay of up to half a second."*

The second most brought-up area for improvement for cloud gaming was, similarly to the responses left to open question two about the features participants would like to see in cloud gaming services, the selection of available software to paying users. Participants do however emphasize here that one of their main concerns with the game selection is the fact that games are often rotated in and out of the service, which could mean that a game they were enjoying and playing often could soon leave the service entirely. These are some of the responses left by participants describing their dissatisfaction with the current selection of games available on cloud gaming services:

- '*''The guarantee that games will not disappear off of the game library."*
- *"The games you play, you can keep playing. Now, sometimes they disappear from the server if the cloud platform removes them, and you need to purchase them if you want to continue playing."*
- *The number of games available. Most of the times now it's a limited library.*
- *Adding previously removed titles back to the service in order to preserve them for the future.*
- *Rotating between games that align with my interests, using an algorithm within my category (for example, RPGs like Skyrim or Elden Ring), offering games I*

*play the most, and providing alternatives within those genres. Occasionally, I am offered games that I will never play."*

Another often-cited issue with the current offering of cloud gaming services was related to both the pricing (with a frequency of 32) and the monetization method often employed for cloud gaming (with a frequency of 20). The participants who took issue with the current method in which cloud gaming is monetized were largely against the use of a subscription-based model, in which you pay a standardized fee to have access to the default selection of video games offered by the service provider. Participants of the survey would rather see this take a different form due to either most of the games not appealing to them despite paying for them, or they are simply not a fan of continuously paying for a service they do not plan to use daily, weekly, or even monthly. The following statements by participants shed further light on this issue.

- *''An all-inclusive price, so you don't have to pay separately for games to play them. For example, this could be offered in packages with varying monthly amounts to offset the costs of the games.''*
- *"I think it's the price that gaming services charge. I often play Call of Duty, and I get a new edition every year. This way, I end up spending less than a Game Pass. The game doesn't cost me 180 euros. If I were to play multiple games simultaneously, it would become interesting. However, for someone who only buys one type of game or a game that lasts for several years, like GTA, the Game Pass doesn't make much sense at this price. When I buy a game physically, I can potentially sell it later, which isn't possible with the Game Pass."*
- *''Having a lower fee entry point with more "games as a service" games available for wider appeal - e.g. Fortnite or Overwatch, since those are free to purchase, why would someone have to get a higher tier when they want to only play a selection of those games available in the full catalog?''*
- *''Being able to pick what cloud games you want, maybe a cheaper fee depending on how many games you want to play.''*
- *''Make it more accessible and affordable for people that aren't able to pay for expensive subscriptions.''*

Including the opportunity for participants to voice their opinions on cloud gaming services openly and not bound by the limitations of a closed survey with scales allowed for a wider view of the current perception of cloud gaming amongst their target demographics.

The four variables that were presented at the start of this paper were hypothesized to affect the willingness to pay for cloud gaming services. When looking at the frequency tables provided in this section it is clear that many other variables are now identified in addition to the ones presented in this paper. There certainly were concerns relating to the sense of ownership and the perceived control consumers of such services have over their purchase, but it was not the dominating topic when looking at the response to the open questions.

A general theme throughout the responses to the three open questions was the concern about cloud gaming services not being as reliable as the current offerings provided by video game consoles and gaming PCs and not delivering the same level of performance/enjoyment that is expected in modern times. The worry about cloud gaming services not matching the performance of existing market options was also observed under the answers to question one *‘’how do you generally feel about cloud gaming?”.*

The most often-sided answers that could be grouped under the label of *‘’seen as a market alternative”* cited that they could see cloud gaming as a nice supplemental service to their current consumption method of choice on the PC or console platform but did not trust its reliability and performance enough to go all in with cloud gaming as their main method of consumption.

The value of digital goods being inherently less valued was also seldom observed in the responses to the open questions. There were a few responses that mentioned valuing the collectible aspect of physical video games and the possibility of selling your used games after having played them, thus being more valuable than digital goods, but these are uncommon compared to the concerns raised about performance, availability, pricing, and game selection.

## 4.8 Hypotheses results

As can be seen in Table 8 the coefficients of the hypothesized relationships outlined in the theoretical framework did not have a statistically significant effect on the willingness to pay for cloud gaming services, although the sense of ownership did border on statistical significance (*p=0.055)*. Consumer habits did produce a statistically significant result (*p<0.001)*, but this variable was not included in the theoretical framework as an independent predictor and was instead theorized as a part of the interaction effect of hypothesis 3, which did not produce statistically significant results. Based on the findings from the statistical analysis conclusions based on the hypotheses can be drawn and are presented in Table 12.

**Table 12**
*Hypotheses conclusions based on linear regression four (Controls+IV+Mod+Int)*

| # | Hypotheses | Conclusion |
|---|---|---|
| H1 | Digital value perception is positively associated with the willingness to pay for cloud gaming services. | Rejected |
| H2 | The sense of ownership is positively associated with the willingness to pay for cloud gaming services. | Rejected |
| H3 | Consumer habits are negatively associated with the relationship between a consumer's sense of ownership and their willingness to pay. | Rejected |
| H4 | Perceived control is positively associated with the relationship between a consumer's digital value perception and their willingness to pay. | Rejected |

# 5. Discussion

In this section of the paper, the results presented in the previous chapter will be discussed and examined. The main findings will be elaborated, and a conclusion will be drawn. The implications for both future academic research and the cloud gaming market will also be considered. Lastly, the research conducted to formulate this academic research paper shall be critically reflected upon to identify the limitations and to formulate recommendations for similar research in the future that aims to explore the other dimensions of the complex topic of marketing and establishing new technologies in an established market.

## 5.1 Discussion of the main findings

The overall theoretical model, as presented in Figure 1, had 20.6% explained variance on the variable of *''willingness to pay"*. For the completeness of the results, three additional regressions were performed. One with only the controls, a second with the controls and the independent variables, and a third with all variables, except for the interaction effect. Based on the results we can now conclude that the addition of the interaction effects did little to improve the overall soundness of the theoretical model.

The effects and significance of the results for regression four are on the lower end of what was expected before undertaking the statistical analysis, as it was hypothesized that the chosen variables, identified in the theoretical framework of this research paper, that these variables would be the main factors influencing the consumer's willingness (or lack thereof) to pay for cloud gaming services. The coefficient of the variable *''digital value perception''* was positive but not statistically significant. This would indicate that the influence of the consumers' value perception has, according to the results this paper has access to, little impact on the consumers' willingness to pay for such services.

This was also reflected in the responses to the open questions. In these responses, not many respondents brought up the fact that they viewed digital goods as being inherently worth less than physical ones, except for a few dedicated game collectors, who generally speaking do not reflect the larger market as a whole. Instead, the problem of not owning or being able to purchase a game was brought up far more often, whether that purchase was conducted physically or digitally was not the key reason.

This can also be seen in the sense of ownership over digital services. The means for the statements of this variable were amongst the lowest presented in this paper, indicating that the respondents did not feel a strong sense of ownership over cloud gaming services. While the results of this study did not find the sense of ownership to be a statistically significant predictor, it did border on significance. The addition of additional statements/questions could have made its statistical significance status clearer.

The relationship between the two independent variables moderated by the two moderating variables of this research paper (perceived control on digital value perception and consumer habits on the sense of ownership) did not have a significant effect on the willingness to pay. As the results of this variable's descriptive statistics displayed this variable had some of the smaller standard deviations and thus had the most uniform answers of the survey conducted with the high per-item mean scores being indicative of the consumers of this market having strong consumer habits.

## 5.2 Academic implications of the findings

The low statistical significance of digital value perception shows that perhaps digital value perception is not the issue it once was. In recent years, accelerated by the pandemic, the acceptance of digital goods and the digital economy has become more and more normalized, with children and young adults now seeing the act of paying larger sums of money for digital wares and services as normal, especially when compared to previous generations (Jiang, 2020). Products or services being sold in a digital format may in and of itself no longer be a deciding or limiting factor in the consumers' decision-making or willingness to pay, even in the world of video games that have held on to physical software sales for far longer than other mediums such as the music or film industries.

This finding does however not mean that consumers are okay with the fact that they have less control over their purchases. Research conducted by Helm et al. (2018) showed that consumers can have a lessened interest in using a digitally purchased product if the sense of ownership is low. Lessened interest in using a product, especially on a subscription-based model as many cloud gaming services are, could thus lead to worse company performance. For this reason, it is important to conduct more research into the topic of the sense of ownership in relation to digitally purchased video games. Much of the body of knowledge's academic backlog consists of research into the sense of ownership of digitally purchased movies, albums, and books. These industries are not one-to-one comparable with the video game industry and many of these papers were accepted quite a long time ago, making new and market-specific data on this topic a nice research gap to fill for future researchers.

The rejection of the hypotheses in this research shows that there are still a lot of other dimensions to look at outside of the ones identified in this paper. The answers to the open questions presented to the respondents to the survey are a good example of this. Two of the most cited problems or areas for improvement for cloud gaming services were, according to the respondents, the technical performance of the services, the selection of available games, and the monetization/pricing strategy used by companies. The technical performance especially was cited often in the responses to all three open questions. Participants did not want to use it as their main way of playing games due to the unevenness and inconsistent gaming experience they received or perceived to be synonymous with cloud gaming services. Future researchers could take the results of this paper and use it as a starting point for their hypotheses to uncover what variables are responsible for the remaining unexplained variance. Given how many respondents brought up technical performance, game selection, and pricing strategy it is not unlikely for these dimensions to be of interest to researchers with academic experience and knowledge of both business, IT, and technology. These fields and not marketing psychological dimensions might have a more significant effect on the consumers' willingness to pay for cloud gaming services.

## 5.3 Managerial and practical implications

The consumers' value perception of digital products and services is strongly associated with the degree of freedom, control, and ownership they have over them Micken et al. (2019). This is also supported by the findings of this research paper. However, as was mentioned before the value perception of digital goods does not seem to be the main limiting factor in preventing cloud gaming services from becoming a more accepted alternative to console and PC game platforms. When companies are evaluating why cloud gaming services have not taken off they might be better off looking at the other dimensions brought up in the open question section of this research.

When looking at the coded responses to the three open-ended questions some additional insight was gained into the problems consumers currently have with offerings of the providers. The sense of ownership and lack of control ranked high among these concerns. The fact that the technical performance of the services on offer also leaves a bit to be desired is also something for managers of these

companies to consider. Although many of these technical performance issues might be reduced in the future as internet speeds and accessibility improve domestically and internationally it is also important to upgrade the host servers of these companies to prevent people from having to enter an online queue when they want to start playing, as some participants of the survey pointed out.

A recommendation that could potentially be interesting that was pitched by some of the participants who were concerned about the game selection, as well as the pricing of the current offerings, is a potential subscription based on interests. Currently cloud gaming subscribers to, for example, X-Cloud all have access to the same set of pre-determined games. Respondents pointed out that they do not have an interest in a large selection of the offering and thus are not willing to pay for it. Allowing customers to select genres or games they are interested in in the forms of *''packs''* could be a potential way of solving both the game selection problem as well as the issue some respondents have taken in the monetization model. Market research and interest gauging in this potential new subscription model would have to be conducted before implementation.

Cloud gaming service providers need to reflect critically on whether or not the subscription model could be successful in the long term from both a consumer and business perspective. Video games cost a lot more money to develop than music and movies which are also delivered to their customers through subscription services. Microsoft's game pass service, which includes access to cloud gaming with Xcloud for the more expensive tiers, is a service that allows customers to download games through the internet and play them on their device as long as they are subscribed to the service. The cheapest tier starts at €15.- a month, with a likely price increase coming in the near future (Flint, 2024). This might scare off potential customers who only play games every now and again. The service has also not been growing at the pace Microsoft and Xbox expected, with only single digit percentual growth year-on-year for most of last year (Tassi, 2024). This minor growth however is largely due to the price hike of such services, as the actual subscriber count did go down (Metro.co.uk, 2024). With the lack of growth for these relatively expensive subscription services and the huge costs associated with operating them for companies (as third-party developers need to be paid a hefty sum for their games to be included in such services), it might also be wise for these companies to look into

other monetization methods to generate more long term sustainable revenue streams as the current model can only work as a near monopoly with massive market share. Based on the comments collected in the open questions, a lot of participants also made it clear that they were not fond of the pricing and monetization method. As there was often too much software that did not interest them specifically without the option for customization.

## 5.4 Limitations and recommendations for future research

The vast majority of the participants who partook in this research originated from the local video game retailer who shared the survey on both their Instagram and Facebook pages. This means that the demographic reached is not necessarily reflective of the larger market for cloud gaming services. Many of the followers of this dedicated game retailer are more enthusiastic about the medium of video games than the average consumer and may have a bias towards the more traditional consumption method of buying physical games for use on their game consoles.

While all scales had acceptable reliability scores, digital value perception had a noticeably lower Cronbach Alpha score *(α=.614).* Looking back critically on this scale and the results that were presented in the descriptive statistics section of the results chapter, the scale chosen might not have been the perfect match for this study. The statements were adopted for use in the context of cloud gaming and the gaming industry as a whole. Some of the statements however might not be ideal for measuring a consumer's value perception of digital products and services. Item statements like ''*I think cloud gaming services outperform alternatives"* and *''I feel the need to look up additional information before paying for cloud gaming services"* Might have been too broad or complicated to measure the concept of digital value perception when only using five items per variable. The same applies to the statements used to measure the dependent variable of willingness to pay, as they might have been phrased too generally to online entertainment services instead of directly mentioning cloud gaming in every statement, although the question header did specify that cloud gaming was the focus.

The coding and analysis regarding the open questions only made use of primary codes and were labeled by only one researcher. It is considered to be good practice for two or three researchers to independently code each statement to come

to a more balanced and fair interpretation of each statement. Due to this research paper being a student master's thesis, this was not possible and only one individual was able to code and interpret the results of this section of the data collection.

This paper focused solely on the consumer psychological dimensions that may influence the consumers' willingness to pay for cloud gaming services and did not focus on factors beyond this. For cloud gaming services to behave and perform as intended high internet speeds and an improved database and server management by the company providing such services are essential. As many participants pointed out during the open questions that were asked at the end of the survey, technical performance seems to be one of if not the main deterrents to using cloud gaming as the main gateway into the medium of video games. This technological aspect of the topic of this paper falls outside of the research domain it occupies and was thus not explored to the fullest. Lastly, this paper does not claim that the variables presented have, for certain, a causal relationship. As it cannot be stated that there is causality based on a singular survey and study.

As was previously brought to light the results of this research paper are indicative of many other variables having a more significant effect on the consumers' willingness to pay for cloud gaming services. The responses to the open questions could be a very good starting point for future researchers to base and identify their independent variables on. The main three that could be of interest are the evaluation of the current technical performance of cloud gaming services, the selection of games currently being provided, and the monetization and pricing strategy currently used by service providers. These dimensions seem like a good fit for researchers with both a business or marketing background and a background in IT or technology. This set of knowledge and skills would be a great fit given the context and would allow for a more robust identification of potential variables, data collection methods, demographical understanding, and technological understanding. An investigation into how a user's internet speeds or PING affects their willingness to pay could be a good example.

For future researchers, it could be interesting to find a more diverse participant group than the one presented in this research paper. Most of the participants who filled out the survey to completion were already followers of a local video game retailer in the Netherlands. This meant that most of the participants were already

quite familiar with the concept of the technology and were largely not very enthusiastic about its rise due to established patterns and consumption habits. Due to the retailer being based in the Netherlands, most of the people who completed the survey lived in the Netherlands and were of Dutch descent. Future research could thus instead focus on the more casual video game player who does not have a preconditioned opinion of cloud gaming services.

## 5.5 Conclusion

This study has shown how digital value perception and the sense of ownership do not seem to have such a significant effect on the consumers' willingness to pay for cloud gaming services as was previously hypothesized. The moderating effect of both existing consumer habits and the perceived control over the purchase on the relationship of the independents on the willingness to pay were also not observed when examining the results. The explained variance of the consumer's psychological variables on the willingness to pay in combination with the most cited problems and areas for improvement for cloud gaming services cited by the participants leads this paper to conclude that most of the statistically significant explained variance of the consumers' willingness to pay might be found in the evaluation of the technical performance, accessibility, game selection, and monetization/commercialization model of the services. However further research into this field is required to definitively prove or disprove this.

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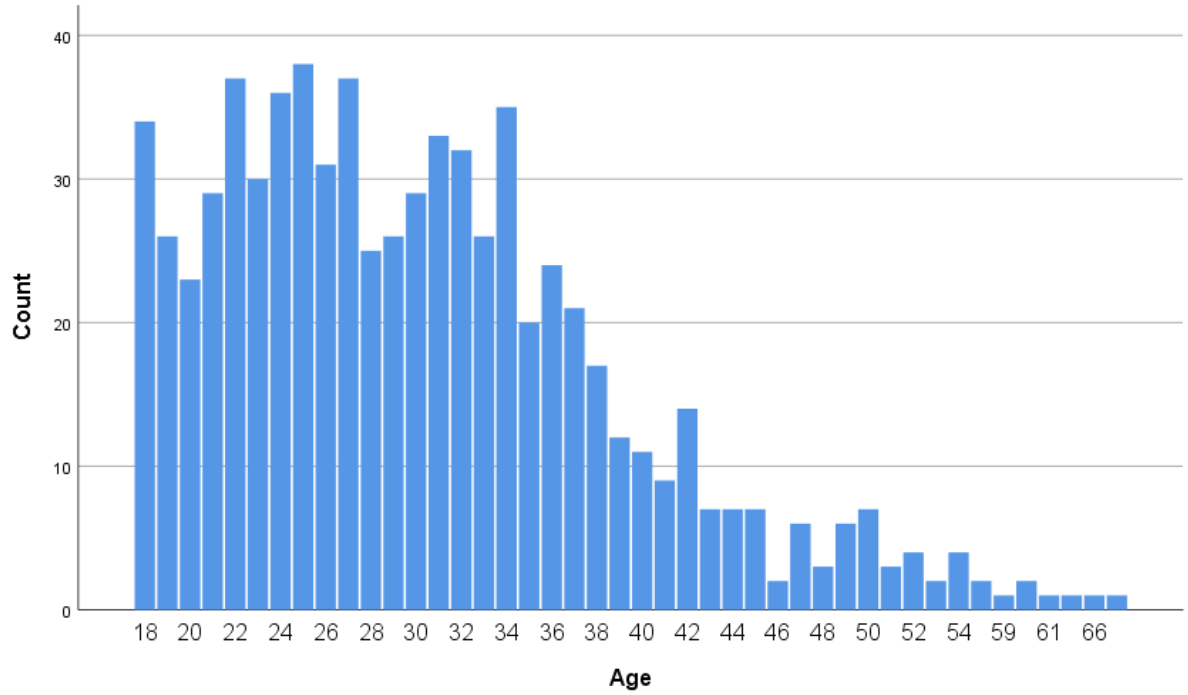
# Appendices

## Appendix 1: Age distribution of the respondents



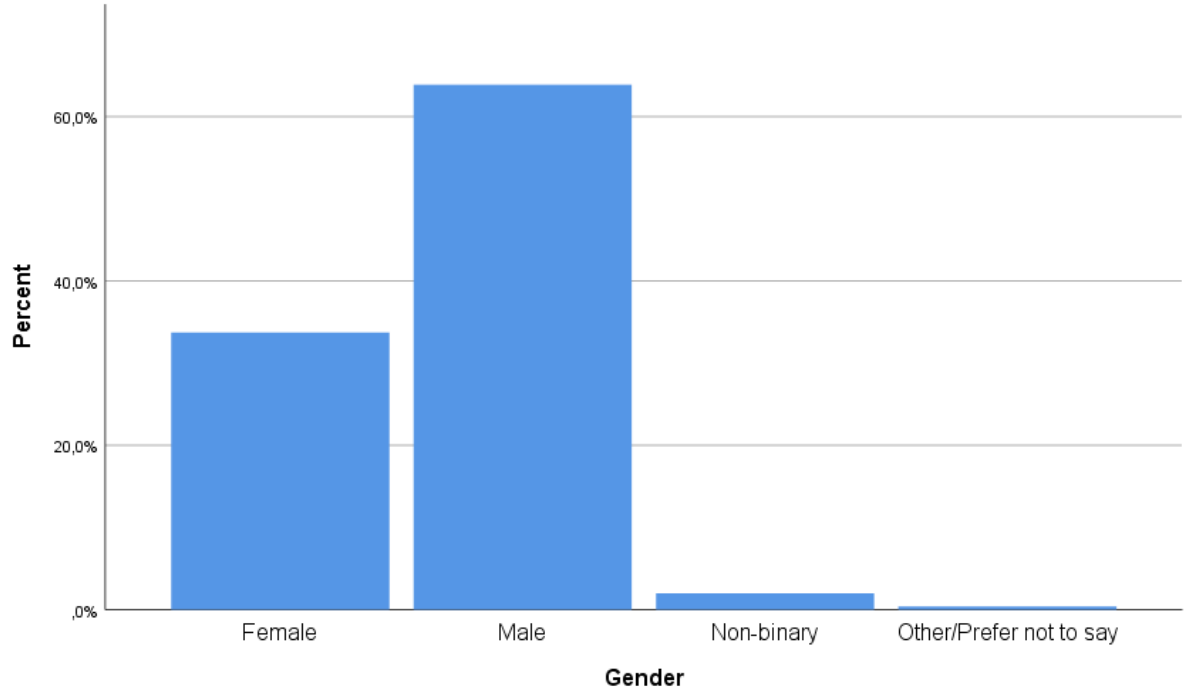

## Appendix 2: Language distribution among participants

| | Frequency | Percent |
|---|---|---|
| EN | 126 | 17.5 |
| NL | 596 | 82.5 |

## Appendix 3: Reported country of residence among participants

| | Frequency | Percent |
|---|---|---|
| Germany | 10 | 1.4 |
| The Netherlands | 712 | 98.6 |

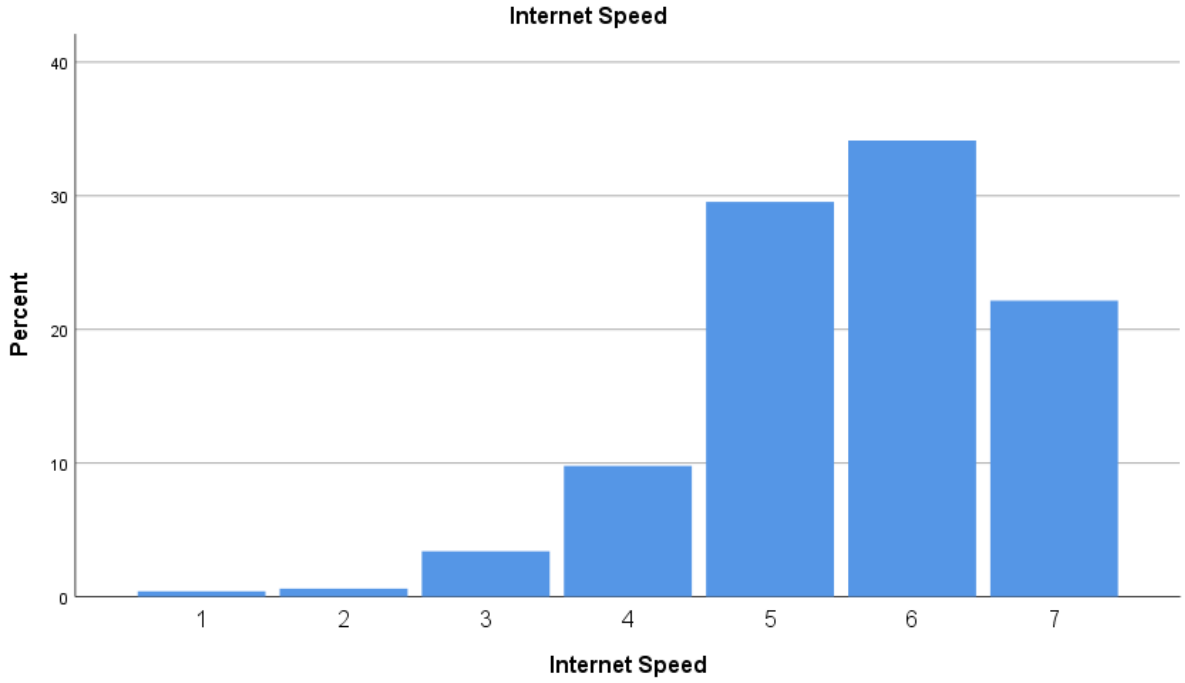
## Appendix 4: Gender identity distribution

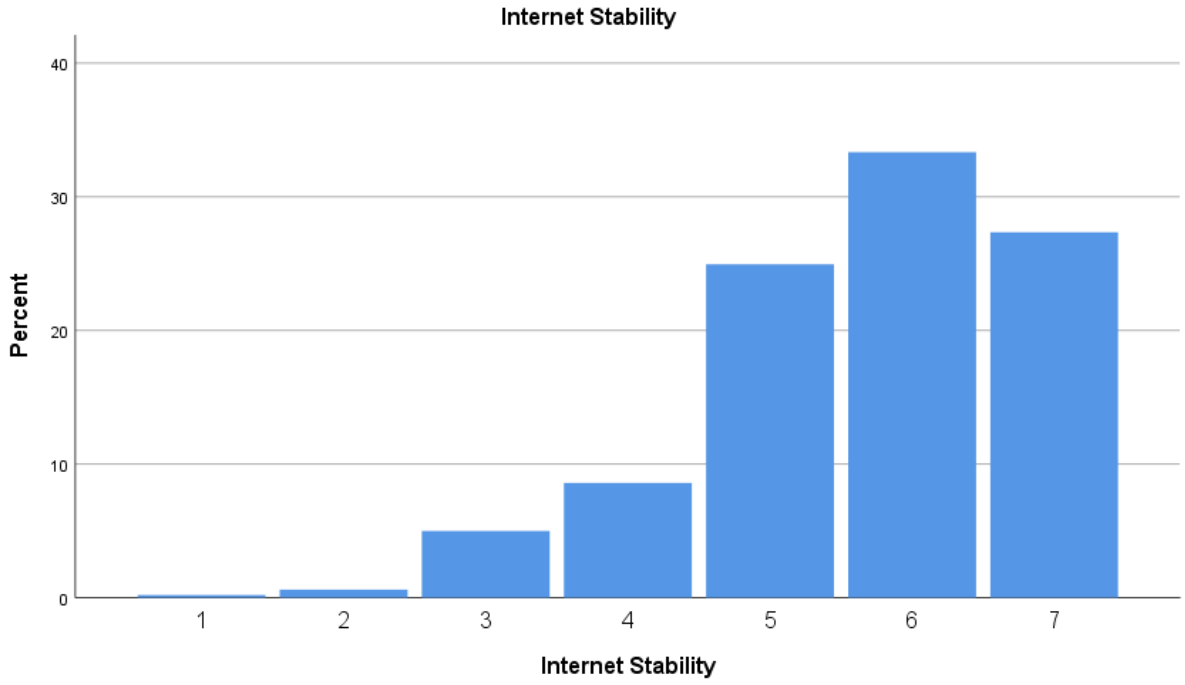



## Appendix 5: Survey duration

| | Median | Mean | Std. Deviation |
|---|---|---|---|
| Duration in seconds | 402 | 596.7 | 198.4 |

## Appendix 6: Self-reported internet speeds and stability

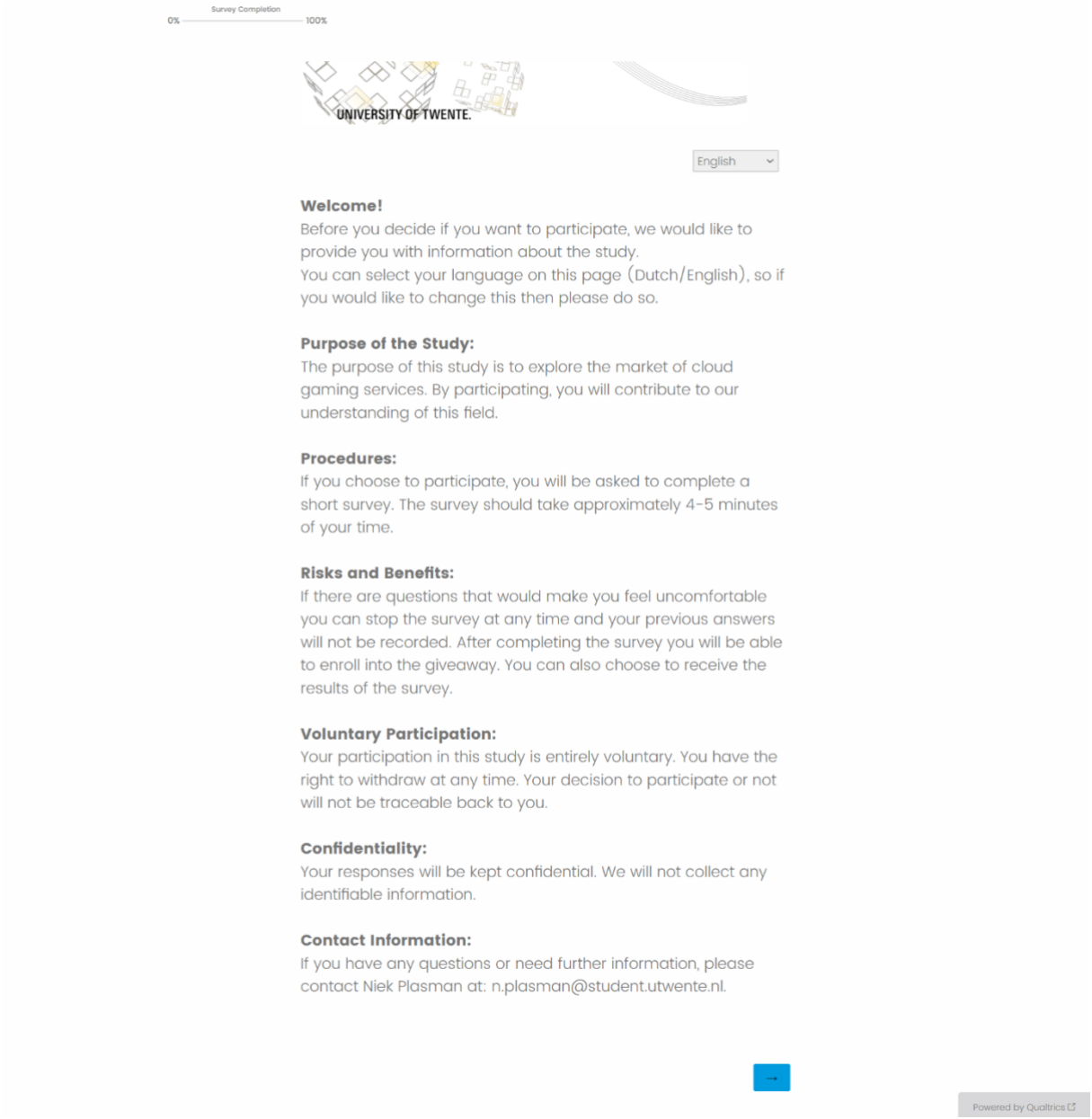


## Appendix 7: Descriptive statistics results per item

| Statement | Mean | Standard deviation |
|---|---|---|
| Willingness to pay 1 | 4.65 | 1.69 |
| Willingness to pay 2 | 5.19 | 1.33 |
| Willingness to pay 3 | 5.51 | 1.42 |
| Willingness to pay 4 | 4.96 | 1.41 |
| Willingness to pay 5 | 6.26 | 1.04 |
| Digital value perception 1 | 4.19 | 1.43 |
| Digital value perception 2 | 4.01 | 1.59 |
| Digital value perception 3 | 5.12 | 1.41 |
| Digital value perception 4 | 3.5 | 1.53 |
| Digital value perception 5 | 2.49 | 1.40 |
| Sense of ownership 1 | 3.71 | 1.73 |
| Sense of ownership 2 | 3.52 | 1.71 |
| Sense of ownership 3 | 4.24 | 1.35 |
| Sense of ownership 4 | 3.99 | 1.51 |
| Consumer habits 1 | 5.65 | 1.35 |
| Consumer habits 2 | 4.88 | 1.60 |
| Consumer habits 3 | 5.52 | 1.37 |
| Consumer habits 4 | 5.58 | 1.31 |
| Consumer habits 5 | 4.64 | 1.55 |
| Perceived control 1 | 3.77 | 1.5 |
| Perceived control 2 | 3.85 | 1.54 |
| Perceived control 3 | 3.43 | 1.45 |
| Perceived control 4 | 4.64 | 1.52 |
| Perceived control 5 | 3.97 | 1.62 |

# Appendix 8: Distributed survey



Survey Completion

0% 100%


English

## Consent

By continuing with this survey, you indicate that you have read and understood the information provided and that you voluntarily agree to participate.

- ◯ Yes, I consent to my responses being anonymously recorded
- ◯ No, I do not consent to my responses being anonymously recorded

← →


English

What is your age?

← →


English

What is your gender?

- Male
- Female
- Non-binary
- Other/Prefer not to say

←

→


English

Where do you live?

- (●) The Netherlands
- ( ) Germany
- ( ) France
- ( ) United Kingdom
- ( ) United States
- ( ) Other: please specify


English

Are you familiar with what cloud gaming services are?

- ○ Yes I am familiar with the concept
- ○ I have heard about it before, but I am not entirely familiar with it
- ○ No I am not familiar with cloud gaming services

←

→

UNIVERSITY OF TWENTE.

English

**Because you are yet (somewhat) unfamiliar with cloud gaming, we will show you a short video. This video will explain to you what it is and how it works.**


UNIVERSITY OF TWENTE.

English

Have you ever tried cloud gaming?

- ◯ Yes
- ◯ No


English

Which of these cloud gaming services have you heard about before?

- [ ] Xbox Gamepass with X-Cloud
- [ ] Google Stadia
- [ ] PlayStation Now
- [ ] Amazon Luna
- [ ] Gforce Now
- [ ] Other:


English

I would describe my internet speed as:

Slow ○ ○ ○ ○ ○ ○ ○ Fast


English

I would describe my internet network as:

Unstable ○ ○ ○ ○ ○ ○ ○ Stable


English

**The following questions are be presented in a scale like format from *'fully disagree''* to *''fully agree''* and are about your opinion on cloud gaming services. Please read each statement carefully and indicate how much you agree or disagree with each one.**

| | Fully Disagree | Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Agree | Fully Agree |
|---|---|---|---|---|---|---|---|
| If I frequently use an online service, I prefer to pay for it over the ad supported tier. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I am willing to pay for online entertainment. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I am willing to use internet banking for online subscriptions. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| If the service gives me a higher quality experience while paying, I would subscribe. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I am willing to pay for video games. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |


English

**How much do you disagree or agree with the following statements:**

| | Fully Disagree | Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Agree | Fully Agree |
|---|---|---|---|---|---|---|---|
| When I scroll through a digital library I get the sense that the content is mine. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I feel like the digital entertainment I consume through services are my own. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I feel like the media I can consume through digital services reflects me. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I feel like the media I consume through digital services are a part of my identity. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |


English

**How much do you disagree or agree with the following statements:**

| | Fully Disagree | Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Agree | Fully Agree |
|---|---|---|---|---|---|---|---|
| I would feel in control over a cloud gaming service. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I feel like I would have a say in how I use cloud gaming services. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I feel like I could influence the performance of cloud gaming. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I feel like I am informed enough to use cloud gaming. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I feel like I would have chosen the best option for me when using cloud gaming. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |


English

## How much do you disagree or agree with the following statements:

| | Fully Disagree | Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Agree | Fully Agree |
|---|---|---|---|---|---|---|---|
| I often buy games on the same platform. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I have a favourite brand from which I purchase most games. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I usually buy games through the same type of consumption method (Physical, download, cloud). | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I often play my games from the same media format (Physical, download, cloud). | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I usually buy the same type of games. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |


English

## How much do you disagree or agree with the following statements:

| | Fully Disagree | Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Agree | Fully Agree |
|---|---|---|---|---|---|---|---|
| I think cloud gaming services are worth the subscription fee. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Cloud gaming services will offer good long-term value. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I think cloud gaming services are going to last long into the future. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I think cloud gaming services outperform alternatives. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I feel the need to look up additional information before paying for cloud gaming services. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |


English

**We have three remaining open questions. Feel free to express your thoughts, depending on how much more you would like to share with us.**

How do you generally feel about cloud gaming?


English

What are the most important features that you look for in a cloud gaming service?




English

What (If anything) would you improve about cloud gaming services?


Thank you for completing the survey! Your response has been recorded.

To enroll into the giveaway or to receive the results please click **here**.

In case you have questions please contact: n.plasman@student.utwente.nl

---

Bedankt voor het invullen van de enquête! Je antwoorden zijn opgeslagen.

Om mee te kunnen doen aan de giveaway of om de resultaten te ontvangen klik **hier**.

Mocht je nog vragen hebben dan kan je contact opnemen met:
n.plasman@student.utwente.nl

## Appendix 9: Dutch survey translations

Translation language Dutch

**Question text**

**Welkom!**
Voordat je besluit of je wilt meedoen willen wij je graag informeren over het onderzoek.
Mocht je de taal willen wijzigen, dan kan dat bovenaan deze pagina (Nederlands/Engels).

**Doel van de studie:**
Het doel van deze studie is om de markt van cloud-gaming diensten te verkennen. Door deel te nemen draag je bij aan onze kennis over dit onderwerp.

**Procedures:**
Als je ervoor kiest om deel te nemen word je gevraagd een korte enquête in te vullen. De enquête zal ongeveer 4-5 minuten duren.

**Risico's en voordelen:**
Als er vragen zijn waarbij je je ongemakkelijk voelt kan je de enquête op elk moment verlaten. Je eerdere antwoorden worden dan niet opgeslagen. Na het invullen van de enquête kan je je inschrijven voor de winactie. Je kan er ook voor kiezen om de resultaten van het onderzoek te ontvangen.

**Vrijwillige deelname:**
Je deelname aan dit onderzoek is geheel vrijwillig. Je hebt te allen tijde het recht om je terug te trekken. De beslissing om wel of niet deel te nemen is niet tot een individu herleidbaar.

**Vertrouwelijkheid:**
Je antwoorden zijn anoniem. Wij zullen geen persoonlijk identificeerbare informatie verzamelen.

**Contactgegevens:**
Als je vragen hebt of meer informatie nodig hebt, kun je contact opnemen met Niek Plasman: n.plasman@student.utwente.nl.

Translation language Dutch

**Question text**

**Toestemming:**
Als je doorgaat met deze enquête geef je aan dat je de verstrekte informatie hebt gelezen en begrepen en dat je vrijwillig akkoord gaat om deel te nemen.

**Choices**

Ja, ik ga ermee akkoord dat mijn antwoorden anoniem worden opgeslagen

Nee, ik ga er niet mee akkoord dat mijn antwoorden anoniem worden opgeslagen

Translation language Dutch

**Question text**

Hoe oud ben je?

Translation language Dutch

**Question text**

Hoe indentificeer je jezelf?

**Choices**

Man

Vrouw

Non-binair

Anders/Zeg ik liever niet

Translation language Dutch

**Question text**

Waar woon je?

**Choices**

Nederland

Duitsland

Frankrijk

Verenigd Koninkrijk

Verenigde Staten

Anders: specificeer a.u.b

Translation language Dutch

**Question text**

Ben je bekend met wat cloud-gaming diensten zijn?

**Choices**

Ja, ik ken het concept

Ik heb er al eerder over gehoord, maar ik ben er niet helemaal bekend mee

Nee, ik ben niet bekend met cloud-gaming diensten

Translation language Dutch

**Question text**

**Omdat je nog enigszins onbekend bent met cloud-gaming diensten zullen we je een kort filmpje laten zien. Hierin wordt kort uitgelegd wat het is en hoe het werkt.**

Translation language Dutch

**Question text**

Heb je ooit cloud-gaming geprobeerd?

**Choices**

Ja

Nee

Translation language Dutch

**Question text**

Van welke cloud-gaming diensten heb je eerder gehoord?

**Choices**

Xbox Gamepass met X-Cloud

Google Stadia

PlayStation Now

Amazon Luna

Gforce Now

Anders:

Translation language Dutch

**Question text**

Ik zou mijn internet snelheid beschrijven als:

**Statements**

Langzaam

Snel

Translation language Dutch

**Question text**

Ik zou mijn internet netwerk beschrijven als:

**Statements**

Instabiel

Stabiel

Translation language Dutch

**Question text**

**De volgende vragen worden gesteld in de vorm van een puntschaal van 'volledig oneens' tot 'volledig eens' en gaan over jouw mening over cloud-gaming diensten. Lees elke stelling zorgvuldig door en geef aan in hoeverre je het ermee oneens of eens bent.**

**Statements**

Als ik vaak een online service gebruik betaal ik hier liever voor dan dat ik het met advertenties gebruik.

Ik ben bereid te betalen voor online entertainment.

Ik ben bereid om internetbankieren te gebruiken voor online abonnementen.

Als de betaalde service mij betere kwaliteit biedt tijdens het spelen zou ik mij abonneren.

Ik ben bereid geld uit te geven aan videogames.

Edit multiple statements

**Scale points**

Volledig oneens

Oneens

Enigszins oneens

Neutraal

Enigszins mee eens

Mee eens

Volledig mee eens

Translation language Dutch

**Question text**

**In hoeverre ben je het oneens of eens met de volgende stellingen:**

**Statements**

Ik denk dat cloud-gaming diensten de abonnementskosten waard zijn.

Cloud-gaming diensten bieden waarde voor op de lange termijn.

Ik denk dat cloud-gaming diensten tot ver in de toekomst zullen blijven bestaan.

Ik denk dat cloud-gaming beter presteert dan alternatieven.

Voordat ik besluit om voor cloud-gaming diensten te betalen wil ik graag extra informatie opzoeken.

Edit multiple statements

**Scale points**

Volledig oneens

Oneens

Enigszins oneens

Neutraal

Enigszins mee eens

Mee eens

Volledig mee eens

Translation language Dutch

**Question text**

**In hoeverre ben je het oneens of eens met de volgende stellingen:**

**Statements**

Als ik door digitale content browse heb ik het gevoel dat het van mij is.

Ik heb het gevoel dat het digitale entertainment dat ik via diensten consumeer van mij is.

Ik heb het gevoel dat de media die ik via digitale diensten kan consumeren mij weerspiegelt.

Ik heb het gevoel dat de media die ik via digitale diensten consumeer deel uitmaken van mijn identiteit.

Edit multiple statements

**Scale points**

Volledig oneens

Oneens

Enigszins oneens

Neutraal

Enigzens mee eens

Mee eens

Volledig mee eens

Edit multiple scale points

Translation language Dutch

**Question text**

**In hoeverre ben je het oneens of eens met de volgende stellingen:**

**Statements**

Ik koop vaak games op hetzelfde platform.

Ik heb een favoriet merk waarvan ik de meeste games koop.

Ik koop games meestal via dezelfde consumptie methode (fysiek, downloaden, cloud).

Ik speel mijn games vaak vanaf hetzelfde media-formaat (fysiek, download, cloud).

Ik koop meestal hetzelfde soort games.

Edit multiple statements

**Scale points**

Volledig oneens

Oneens

Enigszins oneens

Neutraal

Enigzens mee eens

Mee eens

Volledig mee eens

Edit multiple scale points

Translation language Dutch

**Question text**

**In hoeverre ben je het oneens of eens met de volgende stellingen:**

**Statements**

Ik zou het gevoel hebben dat ik controle heb over cloud-gaming.

Ik heb het gevoel dat ik inspraak zou hebben op de manier waarop ik cloud-gaming diensten gebruik.

Ik heb het gevoel dat ik de prestaties van cloud-gaming kan beïnvloeden.

Ik heb het gevoel dat ik voldoende geïnformeerd ben om cloud-gaming te gebruiken.

Als ik cloud-gaming zou gebruiken, heb ik het gevoel dat ik de beste optie voor mij heb gekozen.

Edit multiple statements

**Scale points**

Volledig oneens

Oneens

Enigszins oneens

Neutraal

Enigszins mee eens

Mee eens

Volledig mee eens

Edit multiple scale points

Translation language Dutch

**Question text**

**Er zijn nog drie open vragen. Voel je vrij om je mening te uiten, afhankelijk van hoeveel je nog met ons wilt delen.**

Hoe denk je over het algemeen over cloud-gaming?

Translation language Dutch

**Question text**

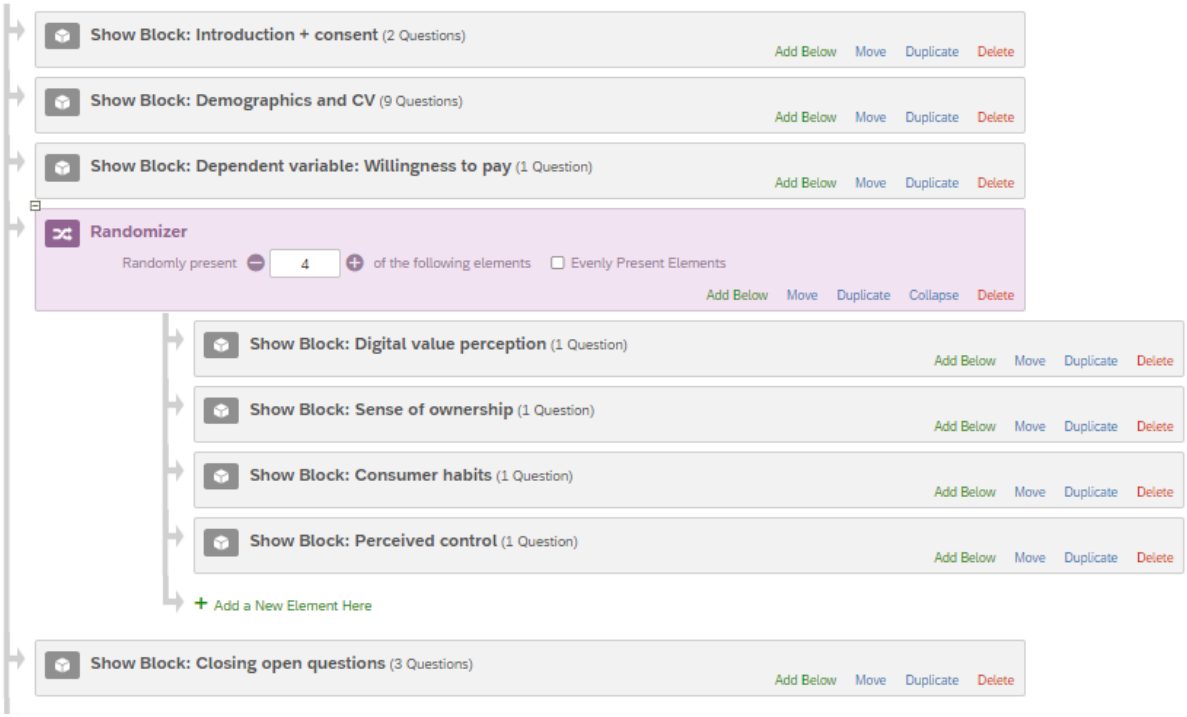
Wat zijn de belangrijkste functies waarnaar je op zoek bent in een cloud-gaming dienst?

Translation language Dutch

**Question text**

Wat zou je (indien mogelijk) verbeteren aan cloud-gaming diensten?

## Appendix 10: Survey flow




## Appendix 11: Ethical approval from the University of Twente

UNIVERSITY OF TWENTE.
FACULTY BMS

240079 REQUEST FOR ETHICAL REVIEW

| | |
|---|---|
| Request nr: | 240079 |
| Researcher: | Plasman, N. |
| Supervisor: | Leszkiewicz, A. |
| Reviewer: | Belotti Pedroso, C. |
| Status: | Approved by commission |
| Version: | 2 |