



St. Petersburg University

Master in Public Management Program

# Impact of Customer Involvement and Reviews on Sales of Digital Distribution Gaming Platform

Master's Thesis by the 2<sup>nd</sup> year

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St Petersburg



*“Video games are the future. From education and business, to art and entertainment, our industry brings together the most innovative and creative minds to create the most engaging, immersive and breath-taking experiences we’ve ever seen. The brilliant developers, designers and creators behind games have and will continue to push the envelope, driving unprecedented leaps in technology impacting everyday life for years to come.”*

—Michael D. Gallagher, president and CEO, Entertainment Software Association

## ЗАЯВЛЕНИЕ О САМОСТОЯТЕЛЬНОМ ХАРАКТЕРЕ ВЫПОЛНЕНИЯ ВЫПУСКНОЙ КВАЛИФИКАЦИОННОЙ РАБОТЫ

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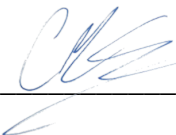
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## АННОТАЦИЯ

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Описание цели, задач и основных результатов	Данная магистерская диссертация, ориентированная на быстро развивающийся рынок видео-игр, обсуждает вопрос вовлечения клиентов и их отзывов, постоянно меняющихся и нуждающихся в исследованиях. Цифровые дистрибутивные игровые платформы завоевали Интернет, изменив поведение потребителя при покупке, что сильно влияет на рынок игр. Таким образом, данная магистерская диссертация направлена на изучение того, как активное сообщество, обеспечивающее обратную связь, видео и игровые трансляции, будет влиять на продажи игр, и как письменные отзывы, видео-обзоры и общение клиентов взаимодействуют друг с другом и в совокупности влияют на решения о покупке видео-игр.
Ключевые слова	Вовлечение пользователей, отзывы пользователей, ранний доступ, бета, цифровое распространение, индустрия видео-игр, рынок видео-игр

## ABSTRACT

Master Student's Name	Celestin Morier-genoud
Master Thesis Title	“Impact of Customer Involvement and Reviews on Sales of Digital Main Distribution Gaming Platform”
Faculty	Graduate school of management
Main field of study	38.04.02 “Management” (specialisation: General track)
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Academic Advisor’s Name	Associate Professor Sergey A. Yablonsky
Description of the goal, task and main results	This thesis orientated on the industry of videogame approaches customer involvement and customer reviews, on a market evolving extremely fast and in constant need of research and better understanding. Indeed, digital distribution platform took over the internet, reshaping our purchasing habit, deeply impacting the gaming market. Hence, this thesis aims to study how an active community, providing feedbacks, videos and streams will impact the sales of games and how written reviews, video reviews and customer involvement interact with each other’s to influence purchase decisions of videogame.
Keywords	Customer involvement, customer reviews, early-access, beta, digital distribution, videogame industry

## **Acknowledgement**

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## **Goal, relevance and research questions**

### **The title of the thesis is the following:**

*Impact of Customer Involvement and Reviews on Sales of Digital Distribution Gaming Platform*

### **The goal of the thesis:**

The overall purpose of this thesis is to study how written reviews, video reviews and customer involvement interact with each other's to influence purchase decisions of videogame.

### **Relevance of the topic:**

This topic is relevant because of the lack of research on impact of reviews and customer involvement on purchases of videogame. The recent reshape of value chain due to the emergence of digital distribution outdate a wide range of researches conducted on the industry of videogame before 2010 and therefore, reveals a need for research in the field. In addition, reviews now take several forms and the concept of video review has to be taken into account in the analysis of reviews.

### **The main research questions are the following:**

- Does customer involvement in marketing and communication process with reviews, videos and streaming impacts purchases of videogame?
- Are videos a more effective type of review than written reviews?
- Do betas and early-access to games increase purchases of videogame at their release date?
- Do positive or negative reviews have a higher impact on videogame purchases?

## **Personal motivation**

Having grown a strong interest for the digital industry for videogames, due to its mix of artistic and economic approach, I decided to focus my research in this field.

I believe that the market of digital distribution of videogame deserves attention for multiple reason. While now being a bigger market than the movie industry, it still often suffers from its old reputation of being a niche market and targeting very specific customers. With a constant yearly growth adjacent to 10%, it can be seen as one of the very fast growing industry as of today, leading to massive opportunities and countless possibilities of development.

Indeed, digital distribution has shacked the value chain of the videogame industry and it is believed that the shortening or disappearance of the distribution chain led to an added value based not on access to product anymore, but based on recommendations and reviews.

Having noticed a true lack of analysis related to reviews impact on digital distribution platform and in the industry of videogame, I saw some potential opportunities for research. I also noticed that that research on reviews impact tend to analyse customer review by taking written reviews only, which is in my opinion a reduction of the reality, as reviews took a larger scale, especially in the digital industry, not only in a written form, but also through videos posted on website like YouTube, or live videos with the new trend of streaming.

Therefore, I decided to analyse the impact of customer involvement and reviews on the sales of digital distribution gaming platform.

## **Structure of the research**

The initial background and context of the proposed research is not a literature review and is not referred to, as such. On the other hand, it can be referred as an extended logical and coherent arguments in order to understand the industry.

Global trends are first approached in the thesis in order to highlight the extremely strong growth of the market of videogame. The overall market is explained with clusters per region but also per platforms. The future trends of the industry are also mentioned, as well as some global consuming habit regarding the platform and hardware.

The distribution of dematerialised content appears in the second chapter, mentioning the evolution of the industry, the fast growth of the digital distribution, leading to a complete reshape of value chain, the benefits and drawbacks of digital distribution. The complete description of the value chain, pre and post digitalisation of distribution is approached in the following chapter.

The fourth chapter approaches the concept of Tetrad gamification elements, which is now a trend inspired from the industry of videogame but now being used by several other companies. As the concept of gamification is a key concept for game design but also implies customer involvement, it is relevant to be approached in the thesis. The Four steps of gamification reveals where customers can be involved in the creation of the product and where customer retention is mostly applied. The story acts as persuasion strategy, with a high potential of leverage, through narrative transportation. Mechanics refers to in game goals, achievement and rewards, stimulating the users in his experience. Aesthetics allows the player to have a better immersion in the game through the choice of graphical design. Finally, technology relates to the means of playing the game, through the different type of platforms available.

The last chapter of the background section highlight the consequences of digital distribution, now having reshaped the market, the value chain, the price perception, business models and opportunities for game studio.

The literature review aims to approach the latest trend of customer involvement, reviews and general behaviour in the industry,

The seventh chapter of this thesis approaches consumer behaviour in digital and purchase intention with several stage before actually conducting a purchase. The reason of purchase intention of videogame but also in game content can be found in this chapter. Customer loyalty and virtual community is then approached, highlighting the importance of having a loyal customer base, followed by switching barriers and recovery satisfaction in digital industries.

The following chapter highlight several concept of digital involvement leading to a more devoted customer base ultimately spreading positive feedback and reviews. Digital customer management and involvement in product design are important concept as they help understanding the value from Beta test phase before release of games.

The last chapter of the literature reviews is focused on the various type of review, in written form with valence and volume but also approaching channels such as Twitch and YouTube, which represent major source of review under the form of video.

The research design, key point of this thesis explains the several steps of the conducted research, with methods, explanation of data sample, hypothesis, measures and results, with explanation of the model built and how to interpret them. It is followed by a discussion of the result, limitation of the research and finally, the conclusion with the theoretical and managerial implication of the thesis.

## Introduction

Through the years, as competition within companies increased in ferociousness, customer acquisition and retention gained an incredible value among any type of businesses. During the past decades, companies fought ferociously in order to continuously attract more customer and increase their market shares. New trends, such as design thinking or gamification started to appear, involving consumers in the product design and marketing activities, providing feedbacks and reviews, helping companies to build better products, strengthening loyalty program while still acquiring new customers.

In order to manage customer relationship at long term horizon, the priority for businesses is to identify and nurture a satisfactory and a mutually beneficial relationship with their customers (Buttle, 1996) and firms should focus their marketing tools to enhance customer attraction and retention to reach this goals (Prykop and Heitmann, 2011).

With another successful year, in 2016, the gaming industry has seen a rise of its global revenues of 8.5%, to \$99.6 billion and a revenue projection expected to reach \$107 billion in 2017. The gaming market will continue to grow in the future, not experiencing the crisis or austerity and constantly benefiting of new opportunities through technological improvement. Moreover, the upcoming virtual reality devices, only starting to enter the market, represent other new opportunities for the gaming industry. While expected to be highly cannibalised on current console and PC game and expected to generate limited revenue at short to medium term, virtual reality might offer new opportunities with high leverage at medium to long term. The particularly fast growing industry of gaming has seen an upsurge in business model. Indeed, being highly correlated to the rising IT industry, the market of videogame had to adapt to the evolution of purchasing habit, soon switching to digital platforms and E-commerce channels.

Researches and studies related to customer involvement and reviews impact in the videogame industry, according to the current digital distribution, remain limited. Indeed, as of today, E-commerce as taken upon the consumer habit and the videogame industry makes no exception to the rules, with a majority of sales taking place through online platforms. These digital distribution platform do not only give the possibility to purchase game, but also act as social network, product design tool and marketing tool, involving the customers, both in the gamification process and marketing process, through reviews. The concept of online review has been evolving and consumers do not only provide written reviews anymore, but also video reviews, such as YouTube video or live review, with streaming. Thus, this study aims to study the impact of customer involvement and of the various type of reviews on the sales of digital distribution platforms.

## **Background and context of the Proposed Research**

Since the beginning of the 2000s, the industry of videogame has faced drastic changes in terms of distribution, from hard copies, games type and production practise towards dematerialisation. This phenomenon of dematerialisation witnessed an acceleration with the success of smartphones and tablets since 2010, impacting both small and large companies in their organisation, size, commercial approach, strategy and development.

Before conducting research, it is necessary to establish the context and clearly understand the market of digital distribution for videogame. New trends have made their apparition in product design and business models of companies, involving their customers in the creation of future products or marketing activities. Therefore, it is crucial to first understand the gamification process and the business model in the videogame industry in order to see where the customers might be involved in product design and marketing, in order to provide feedbacks and reviews.

This chapter about background and context of the proposed research can be referred as an extended logical and coherent arguments in order to understand the industry and a premise to the literature review.

### **Global trends in the videogame industry**

The industry of video game, also referred as interactive entertainment industry (Johnstone, 2014), is the economic sector related to the development, marketing and monetising of videogames. While having grown as a niche market until the middle of the nineties, it has rocketed to mainstream, in less than two decades, overtaking the movie or music industries, with a global revenues jump of 8.5%, to \$99.6 billion, in 2016.

China was the country with the highest revenue on the gaming market, with 24.4 Billion USD\$, followed by the United States of America with 23.6 Billion USD\$ revenue. As a matter of fact, due to its size and proportion of gamers, Asia-Pacific region is generating the highest revenue at the level of the global market. Indeed, in 2016, 58% of growth of the global games market was generate by the Asia-Pacific region (Newzoo, 2016). On the other hand, the African region remain very small in terms of consumers, but is starting to rise, due to the access to smartphone.

Table 1: 2016 global games market per region with year-on-year growth rates

Region	Annual Revenue Bn\$	Market Share %	Growth %
Asia-Pacific	46.6	46.8	+ 10.7
North America	25.4	25,5	+ 4.1
Western Europe	17.3	17.4	+ 4.4
Eastern Europe	3.0	3.0	+7.3
Latin America	4.1	4.1	+ 20.1
Middle East & Africa	3.2	3.2	+ 26.2
2016 Total	99.6	100	+8.5

The year 2016 was another pivotal year for the gaming industry. Indeed, the new rise of Esports and live streaming, the appearance of virtual reality devices on the market and the rise of games on smartphone are changing the landscape of the industry on a global scale and at an unimaginable pace. Managing the different communities of the industry is therefore at the centre of every game company's strategy (Newzoo, 2016). Another trend of 2016 is the success of card battle games (such as hearthstone, the 2<sup>nd</sup> most played game in the world) and skin trading clearly indicate a new desire of consumers to create, collect, show off and even earn money. This trend led by Blizzard, Valve and Chinese game companies act as a new layer of entertainment and interactivity and will impact the next years of the industry (Newzoo, 2016).

According to Peter Warman (2016), CEO of Newzoo, the new trend of virtual reality and augmented reality will ultimately reshape the world we live in but might still have an impact remaining limited on the gaming industry in the near term. Indeed, Virtual reality is not yet considered a new segment in the gaming industry and game software revenues from virtual reality will remain marginal in a near future, while being absorbed into current Console, PC and Mobile revenues, while generated by software sales, spectator content and live viewing formats.



Table 2 : 2016 global games market per segment with year-on-year growth rates

Platform	Annual Revenue Billion \$	Market Share %	Growth %
Console	29	29	+4.5
Mobile Phone	27.1	27	+23.7
PC	26.7	27	+4.2
Tablet	9.8	10	+6.4
Casual Web games	5.2	5	-7.5
Handheld	1.8	2	-24.1
2016 Total	99.6	100	+8.5

The console are the leading platform in the industry, but the mobile phone segment is expected to become the leading one, due to low barrier of entry and the availability of free games. The growth speed of mobile gaming depends on the region, China and Southeast Asia having the early adopters in this regard, especially in Esports. Western market are expected to have a slower adoption process of mobile Esports and users are expected to be driven through app such as Youtube, Kamcord or Twitch (Peter Warman, 2016).

While PC does not have the largest market share, it is still considered as the hub of the industry. Indeed, PC and mobiles are considered to be essential devices, while console is not (Newzoo, 2016). A console is usually required to make the leap to a platform people need to own in order to play some game, but the PC is a customisable device in order to suit a specific experience. PCs also enhance the ease of sharing online content. Indeed, consoles do provide streaming services but PCs allow to use multi-screen setup, are better for online social network, film videos easily released onto Youtube or live stream, giving a strong advantage for players. Moreover, PCs can be upgraded more naturally than consoles do. 87% of all console gamers also plays videogames on a PC.

## Digital distribution for videogames

Content delivery, online distribution, electronic software distribution, or most commonly called, digital distribution, is the distribution of media content such as video, audio, software and videogame. It describes the process of distribution over an online delivery medium, like internet, bypassing physical distributions methods, like CDs or Paper.

Videogames dematerialisation is the phenomenon of the gradual transition towards a digital distribution of video games. Digital distribution is the delivery process of video game content, without the exchange or purchase of new physical media.

The potential of digital distribution has remain hypothetical until 2010. Indeed, Jens Uwe Intat, (2008) vice president and general manager of the European subsidiary of Electronic Arts (EA Games), did not believe that dematerialisation would occur before at least 20 years and stated: "*We used to be under 1 GB, but now we make games weighting 8, 9, 10 GB. [...] and if broadband technologies allows one day to distribute 10 GB in half an hour, we will have games weighting 100 GB*".

One year later, according to the forecast of Michael Pachter (2009), digitally downloaded games were to account for about 2% of industry sales by the end of the year or about \$ 400 million. He estimated that demand will tend to double annually, in the next years.

As a matter of fact, the evolution of digital distribution for videogame has rocketed up to a level that experts did not forecast.

The growth of the videogame market is now mainly driven by dematerialised distribution, according to the French Institute of Public Opinion (IFOP), on behalf of Hadopi, the French anti-online piracy body and the SNJV, the French video game sector federation, which conducted a major study in September 2014, including a framing and quantitative analysis of the dematerialisation of videogame. Indeed, in 2014, 90% of the PC games were sold through digital distribution platforms. The study also demonstrate that 56% of gamers in France are playing fewer games on consoles and dedicated physical equipment since the rise of digital distribution.

The prevalence of digital distribution since 2010 has allowed independent game developers to distribute their games through their own platform, without the need to negotiate deals with publishers, according to a study from statesman (2011), not relying on conventional boxed sales to see profit anymore. Thus, it led to significantly reduced production, deployment and storage costs, over the retail distribution system.

In comparison to physical games, videogames acquired through digital distribution platforms cannot be lost or destroyed and can be re-downloaded at any time. Digital games can be purchased immediately, without the need to find a retail shop, with an immediate access to the game. Sales offered by digital distributors often lead to saving at price below what a retailer would be able to offer (Gabe, 2007)

In the early age of digital distribution gaming platforms, in 2007, Gabe Newell, President of Valve Corporation and precursor in the digital distribution for PC videogame, has stated in an interview, before becoming the market leader in digital distribution for videogame on PC:

*“The worst days were the cartridge days for the NES. It was a huge risk – you had all this money tied up in silicon in a warehouse somewhere, and so you’d be conservative in the decisions you felt you could make, very conservative in the IPs you signed, and your art direction would not change, and so on. Now it’s the opposite extreme: we can put something up on Steam, deliver it to people all around the world, and make changes. We can take more interesting risks. [...] Retail doesn’t know how to deal with those games. On Steam there’s no shelf-space restriction.”*

- Gabe Newell, Rock, Paper, Shotgun, 2007

### **Videogame Value chain**

The Value chain of videogame has faced major evolutions since the digital distribution. Flew & Terry (2005) and Ben Sawyer & Peter Smith (2008) has observed that the gaming industry value chain consisted of six connected and distinctive layers, when the retailers were the major distribution channel:

- Capital and publishing layer: Which involves the payment for development of new titles and returns through licensing of the titles
- Product and talent layer: The second step involves developers, designers and artists working in a company as part of development teams under individual contracts
- Production and tools layer: This third step consist of the content production tools, game development, middleware<sup>1</sup>, customisable game engines and production management tools
- Distribution layer: Which consists of the publishing industry in charge of generating marketing catalogues of games for online distribution or retail.

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<sup>1</sup> Refers to subsystems of functionality within the engine of the game used for graphical purpose or performance optimisation, optimising the level of details.

- Hardware layer: This layer refers to the sales of boxed games but also to the providers of the underlying platform, which could be based on console or PC, accessed through online media or accessed through mobile devices. This step also takes into account network infrastructure and virtual machines or software platforms like Java, Flash or browsers.
- End-user layer: The final layer refers to the player of the game

However, as digital distribution has shaken the industry of videogame, the value chain seen above is not accurate anymore (IFOP 2014). As a matter of fact, digital distribution platforms led to a shortening of the value chain, concentrating the supply around fewer major players. In most cases, the value chain has shrunk from six steps to only two or three (IFOP 2014), which are:

- Studio: All activities including licensing, product development
- Distributor: The licit distribution focuses on a few majors' players, regardless of the game platform (Google Play and App Store for Smartphones, Steam for PC, etc.).
- Player: The end-user layer

As previously mentioned, some companies have created their own platform, like Blizzard with their platform Battle.net, reducing the Value Chain to Studio to Player. Indeed, digital distribution has led to a sharp margin increase for developers, which work out as high as 66% for mobile games and even 100% in cases of a two steps value chain, Studio to Player (IFOP 2014).

The price perception from the players' point of view has been disrupted due to two major factors (IFOP 2014):

- Official resale networks of "activation keys" which frequently use promotions with price reduction, drawing prices down
- Resellers of unofficial "activation keys", forming a "grey market"

### **Tetrad gamification elements**

Customer involvement appears in every field, in many forms, and the gaming industry is no exception to the rule. On the gaming market, loyalty usually comes first through the product itself. Indeed the product carries the highest customer retention leverage (Deckert, 2014). Videogames do not only create loyalty, they also create addiction.

In order to understand customer involvement in the videogame industry, it is necessary to first understand the gamification process and at which stage the customer can be involved in order to create a better product and at which stages the reviews and feedback will be useful to the game.

A game is a mean to provide entertainment or amusement. In the field of video game, such as most artistic mediums, it is meant to create an experience (Lauer, 2015). The experience tend to be the key to good game design. The elemental Tetrad model proposed by Schell (2008), a well-known framework for game design, consists of four elemental design characteristic in order to create an affective and cognitive ecosystem around the theme of a game. The story, first element, includes all the narrative format and provide context to a game, adding meaning to the consumption experience. The second element, the mechanics, refers to structural aspect of the game and focus mostly on success recognition by rewards through the game levels and incentive structure. Game mechanics set up a dynamic building the user experiences (Huotari & Hamari, 2012). Aesthetics, the third element stands for the look and the feel of a game, focusing on a sense of purpose and strengthen the development of the first element, the storyline. Indeed, for most of the games, focusing on visual imagery and presentation is important in order to create an immersive experience (Hofacker & al. 2016). The last element, technology, focus on the medium shapes the way experience, through the gaming device or the type of platform.

### **Story**

Story is highly recognised as a persuasion strategy. While it benefits of strong reputation and potential leverage, most companies have limited understanding of how the storyline can be used in terms of marketing purposes. According to Green and Brock (2000), narrative transportation stands for a “*convergent process in which all of the person’s mental systems and capabilities become focused on the events occurring in the narrative*”. From the point of view of Van Laer & al. (2014), the narrative transportation consists of three steps. Firstly, the receiver should focuses his attention on the development of the story and analyse it. Then, narrative transportation shall be achieved through mental imagery and empathy, mental imagery being the feeling of taking part to the story and empathy reflecting the attempt to understand and relate to both the character and the world. Together, these two component create the “suspension of disbelief”, transporting the gamer into the world of the game. Thus, the story element provides meaning and context for the application of task to the player experience.

When player feel transported, they tend to be less aware of their own beliefs, intentions and attitudes. This phenomenon contrasts to analytical persuasion, in which people are more likely to draw on personal beliefs (Petty & Schumann, 1983). According to Slater & Rouner (2002) narrative transportation could lead to “at least temporary acceptance of values and beliefs representing a shift from the existing beliefs of an individual”. This suggest that a story element can make game-advertising more efficient.

Advertising and in game purchasing are often used to generate external revenues, sometimes appearing during the game, especially on mobile platform. According to (Hofacker & al. 2016) this business model may devalue the game as gamer's experience through the element of story is interrupted. A greater focus on maintaining narrative flow should be made not to threaten the game experience.

It is argued whether advertising activities should be part of gamification narrative. Indeed, ads appearing during the gaming experience are usually considered intrusive, drawing the attention away from the purposeful act of gaming, according to Li & Edwards, 2002. On the other side, advertising intrusiveness makes the ad stand out and enhances its effect. Priming effect is based on the idea that playing a game activities a scheme that makes processing of a congruent ad easier (De Pelsmaker & Geuens, 2002). On the other hand, interfering effect is derived from the assumption that thematic blending of gaming and ad will diminish ad recall (Furnham & Gunter 2002). Indeed, if advertising is not goal orientated, player seems less likely to click on the intrusive ad.

### **Mechanics**

Mechanics refers to the procedure and rules in the game through goals, achievement and rewards. Game mechanics usually include badges, points, progress bars and leader boards. Deterding (2012) argued that mechanics only refer to "forms of feedback within the game", while the real games' power is created by forcing gamers to make choices in the pursuit of difficult goals. In the point of view of Salen and Zimmerman (2004), a core element of game design is creating a meaningful experience through connection between action and outcomes, the reward system itself helping to motivates players, signalling social status and creating loyalty.

Recent studies have proved that rewards of uncertain magnitude usually motivate consumers more than do reward with known magnitudes, even if the expected value of the uncertain incentive is lower (Hofacker & al. 2016). Ranking system also form a basis for providing incentives (Olson 1965, Willer 2009). In the context of videogame, this concept is usually referred as "badging". Indeed, visual identifiers are provided to the player in order to reflect the merit for in game achievement, providing social-status within the game, as seen in online games such as World of Warcraft or Call of Duty (Hofacker & al. 2016). Accumulating symbolic rewards can occasionally become dysfunctional from a marketing point of view as they might be integrated with real world currencies and marketing goals related to the firm's goods and service (Hofacker & al. 2016). However, in a closed gaming world, this integration referred as "game's magic circle" should be

done with care in order “not to break the magic”. Indeed, over abusing it might cause frustration and exit from customers (Lin & Sun, 2007).

It has been demonstrated at a wide level that over the time, the motivation coming from intensives tend to decrease over the time, undermining intrinsic motivation. But, according to Blohm and Leimeister (2013), this decrease doesn't affect the reward system of gaming industry, as the collection provides visual evidence of the gamer's performances, facilitate social interaction in a competitive environment, documents the progress of the gamer and acts as a social recognition tool within games. Nevskaya & Albuquerque (2015), suggest that rewards should continually be offered in order to maintain interest and taking them away would lead consumers to abandon the game. However, extrinsic rewards should be controlled in order not to kill intrinsic joy and motivation at long term. Thus, for many consumer, reward are never fully internalised and act as retention tool and competition, skill development or enjoyment must be carefully aligned to create a real sense of immersion,

The flow, another part of mechanic element, is an optimal psychological acting as a balance between the challenge of the game and the skill needed (Csikszentmihalyi, 2014). Indeed, picking difficulty level in the game is an important issue in order to program the reward system in the gamification design. A too low level of difficulty will lead to boredom, but a too high level of difficulty will lead to game abandonment (Nevskaya & Albuquerque 2015). Thus, designers have to find the “right spot” of difficulty for the given rewards, according to the type of skill. As stated by Hoffman and Novak (2009), the relationship between difficulty and reward leads to positive outcomes, the flow benefiting from brand attitudes, purchase intention, unplanned purchases and online purchases.

According to Johnson, Bellman & Lohse (2003) and lately to Lakshmann, Lindsey and Krishnan (2010), consumption, satisfaction and loyalty depend upon gamer's proficiency and their level of practice. Interface mastery is also a key point to meet the needs of competences, autonomy and relatedness (Przybylski, Rigby & Ryan, 2010).

Games can offer other type of rewards, with opportunities to generate non-monetary values. Gamification can reward consumers with cognitive benefits of skills development, acquisition of new information or learning, expanding consumer knowledge and skills (Baron & Nambisan, 2009). Game can also offer social recognition, through interactions with appreciation, compliment and reciprocal exchange with other players (Baron & Nambisan, 2009).

Mechanic gamification also include choices about consumers' visual perspective. The visual perspective changes according to the games. In some games or in different scenes, the action is



seen as a participant, in other the action is seen as an observer. In a first-person perspective (e.g., driving or shooter game), the participant is likely to behave more viscerally and act on his own perspective. On the other side, a participant with an observer's perspective (3<sup>rd</sup> person perspective) tend to engage in more detached and deliberative actions. However, the study in this field currently remains limited and marketing effectiveness of this mechanics remains unknown.

### **Aesthetics**

The third element of gamification allows the player a better immersion in the game, by experience the beauty and the culture of the virtual universe, but also through graphical choices regarding level of detail, interface, and feedback indicators (such as gauge, progress bar). All the features related to aesthete are meant for a creative vision that enhance engagement from the player, through narrative transportation.

Visual semiotics is also part of aesthetics, bringing meaning through various elements in visuals, in conceptual and narrative representations (Rose 1978). Pictorial representation of product in games (e.g., a Coca Cola Logo on football field in a Fifa game) are conceptual as their position remain stable and act as brand awareness. On the other hand, narrative representation portrays transitory processes of visual elements connoting behaviour (e.g., a game hero drinking a can of Coca Cola) (Kress & Van Leeuwen, 2006).

### **Technology**

The last element of the Tetrad gamification is a medium through which a story is told. While console and computer gamers are looking for a fully immersive gaming experience, mobile gamers are looking for games providing transient benefit, (e.g., like relieving boredom in a train). Mobile game should be made considering consumers limited cognitive resource and have low entry barriers, as rapid technological changes will likely lead to a succession of new games (Hofacker & al. 2016). Mobile gaming is currently the fastest growing gaming segment and the changes in mobile platforms constantly bring new opportunities and engaging experience, with larger devices and tablets. Indeed, studies reveal that tablet owners play game more actively and download more games than mobile users, the size of the screen truly plays an important role (Montel, 2013). The evolution of computer and console have a similar gamification approach but with the brand of the console sometimes being an entry barrier by itself to some games. Moreover, the current apparition of virtual reality devices allow new opportunities, especially for console and computer gaming.

Narrative transportation was developed for oral and verbatim storytelling and had been extended in the gaming industry in order to increase the media richness and enhance narrative immersive experience (Biocca, 2002). Polichack and Gerrig (2002), state that audio-visual elements should



be used in game in order to generate a richer participatory response, engaging the sense of hearing. While, console and computer games often go for highly immersive or epic music with famous composers and orchestras, mobile games strategies are simpler while having stressful music in order to stimulate the player and reduce its sense of boredom.

A typical console game usually benefit of low entry barrier for new players, despite the type of console. Indeed games tend to be relatively easy to handle but have an increase difficulty as the player becomes more proficient at the specific game. While console and especially, computer game can see a difficulty level increasing exponentially, mobile games, due to the lack of involvement and need-gratification, makes this non-linear difficulty repulsive for the consumer (Hofacker & al. 2016).

### **Business models**

The video game industry has managed to multiply the economic models and learnt to adapt its sources of income to the benefit of the players. Today's heterogeneous population with varied profiles and expectations of the gaming experience led to no fewer than seven economic models that coexist today, ranging from fully paid to completely free offer (IFOP, 2014). A full chart with a combination of business model can be found in Annex 8.

- **Free**

The game can be player for free, without including any payment at any given point.

- **Pay to play (P2P)**

P2P is the on-line transposition of the physical model of sales per unit. This model represent the majority of the sales of the digital videogame market, with 64% of turnover of digital games. Nevertheless, it is expected to decrease in the near future, the digital market of PC game being easily adaptable to other type of payments.

- **Subscription**

Online subscription allows gamers to play a games without any limitation, with or without fixed entry fees (access to the game platform). This model can only work with games whose playability is unlimited, like MMO such as World of Warcraft, with a strong social dimension.

- **Freemium**

The Freemium model consists of a free gaming experience offer including certain constraints:

- A temporal constraint: duration of free play experience is limited, for example 15 days, in order to test the game before buying it.
- A playability constraint: only one zone of the game is accessible for free. For example, a racing game will only have the first circuits or only a few car models available.

This free trial concept must encourage purchase, which may be a subscription or a unit purchase of the game. This model evolved from the previous “demo” of game, which tend to disappear (Macchiarella, 2011).

- **All You Can Eat (AYCE)**

Also called “Paying streaming”, the "AYCE" model consists of unrestricted access to a limited set of online games, assuming the payment of a subscription fee, usually monthly. It can be compared to the music streaming model of Deezer or Spotify which offer unlimited listening of several million titles online with a monthly subscription. This model is relatively undeveloped and rather adapted to casual games only.

- **Free to play (F2P)**

With free-to-play games, the gamers can play the entire game for free, without any restriction, but also has the opportunity to pay for additional content, such as in-game currencies, better equipment or new characters.

- **Pay & Play More (P&PM)**

An adaptation of the pay-to-play model, including the possibility of continuing to pay during the game for additional content via micro-payments: these are adds-on, accessories or DLC.

## **Consequences of digital distribution**

The transition towards digital has had several consequences over the last 5 years (IFOP, 2014).

- The “faire price” tends to be blurred, due to the amount of diversity of platforms, often providing discounts and the existence of a “grey market” of second hand game and activation keys.

Grey markets usually distribute games with a principle of caution and did not have the authorisation to sell the game from the developer. It can usually be identified when prices tend to vary a lot between countries.

- Digital distribution led to a shortening, and even a disappearance in some cases of the distribution chain with an added value now based on recommendation and reviews, rather than the access to product.
- Game developers have faced an evolution of their activity as they do not create games anymore but now sell them directly, with better margins. While in the previous value chain, they only earned an average of 8% on the game sold to the client (IFOP, 2014), they now represent 66% of the added value for Mobile and even 100% for developers with their own platform.
- Transition from one physical value chain with a “few to few” model, to a model “many to many”. In the first model, few publishers were selling games to relatively few players on PCs and consoles, while in the second model, many actors/editors, even fairly small studios and self-employed persons can now search for many potential customers (PC, console, mobile, tablet, connected TV, app, social media)

More than a value chain, it can now also be seen as an ecosystem in which roles are less defined, with many more numerous actors wanting to increase the quality and the proximity of their relation with customers, through behaviour analysis, in order to capture the maximum added value.

## **Literature review**

While the initial part of this thesis aimed to approach the latest trends of an industry evolving extremely fast, this literature review will focus on customers themselves and their involvement.

The first part of the literature review highlights digital customer behaviour, understanding the gamers' behaviour and what drives their purchasing habits.

The second part of this literature review will approach the customer involvement itself, through product design and communication processes, and the different shapes reviews can take.

## **Digital consumer behaviour**

According to Hwang and Jeong (2014), family influence and media campaign are two major factors that influence the intention to purchase, assuring e-commerce companies a future potential with effectively designed advertising campaigns and strategies to engage more consumers. Moreover, in the context of consumer purchase, price perception is found to be not as important

as we could expect. Indeed the reduced effort tends to be the main factor in consumers shopping experience (Hwang and Jeong 2014), The most important characteristics impacting the consumer's perception towards customer service appears to be the responsiveness in terms of information about company policies, product returns, pricing, delivery time, guarantee and on-line assistance (Hwang and Jeong 2014),. Moreover, product display and visually appealing features are also important factors for customers.

Internet services are intangible and heterogeneous and might be perceived as representing a higher risk than a face-to-face transaction (Li, 2014). Issue like payment security and privacy are considered the most important features in terms of risk factors. Consumer trust in online stores depends on factors like perceived size and reputation of the store or the company (Jarvenpaa et Al. 2000). However, many customers consider the “WWW” as a reliable source of added value that cannot be substituted by traditional retail channels.

Firms are likely to perform better if they are able to target, through their marketing campaign, individuals who are net savvy, personally innovative and who are less price sensitive and value customer service. Moreover, the ability to enhance the reputation in the market through highly trustable website with insurances mechanisms is likely to induce purchases (Hwang and Jeon, 2014). Companies which are able to portray themselves as large firms will increase the potential purchases.

### **Purchase intentions**

The concept of purchase intention can be used to predict and lead to an actual purchase behaviour (Morrison, 1979). According to (Hsuan & Hung-Tai, 2011), it is not only a tool to predict a purchase, but purchase intention is defined as consumers' intention to actually conduct the acquisition of the product of a firm, in the future. In the online environment, various studies have shown the cues impact on consumer purchase behaviour (Davis, Wang & Lindrigues, 2007; Ethier, Hadya, Talbot & Cadieux, 2006). Customer experiences of blog or platform can be seen as an emotional responses to environmental psychology, while being spurred by environmental cues (Husan & Hung Tai, 2011). Consumers are likely to perceive a good customer experience if they are triggered by attractive stimuli such as interesting interactions or vivid information. Moreover, in an ongoing search context (searching for information and reviews from other customers), experiencing pleasure and entertainment or building a valuable dataset of information for future motives enhance the likelihood of purchase outcomes (Husan & Hung Tai, 2011). Indeed, the consumption experience is stimulated by the customer engagement, through senses like feel, think, act and relate.

During buying process, it is known than consumers move through several stages, starting with awareness, familiarity, consideration, evaluation and purchase (Kannan & Li, 2016). Whenever a consumer receives value consistently at the purchase of a product, he is more likely to become loyal to the brand. In an offline situation, the consideration and evaluation stages are fairly extended while in the digital environment, these steps are compressed or even dismissed, due to the access to a wide range of information (Edelman & Singer, 2015). Therefore, on digital distribution platform, customers can evolve through the different step in a fundamentally faster way.

The search for information is an important factor in the customer's decision journey. Early research studying the impact of evaluation stages with the influence of digital environments, on the automobile purchases, revealed that the availability of information and reviews on internet shortens considerably the evaluation of the product, leading to a purchase (Ratchford, Lee & Talkudar, 2003). These results reveals the importance of the reduced time spent searching for information, leading to cost efficiency and more efficient purchases processes in digital environments.

Shi and Zhang (2014) have demonstrated that digital consumer behaviour tend to evolve over time through distinct states. The evolution is attributable to the influence of prior various usage experience correlated with various decision aids. As a matter of fact, existing customers can influence others potential buyers with online reviews or social media, both during pre-purchase and post-purchase clusters (Court & Al. 2009). According to Seiler (2013), customers will decide on the amount of needed information in proportion to the search cost (time spent), leading to a purchase. Seiler (2013), also showed that customers do not search in 70% of the shopping experience, due to high cost of search. If the search cost is reduced in half and therefore, if information are easily accessible and centralised, the elasticity of demand can be more than tripled (Granados, Gupta & Kauffman, 2012).

A study conducted by Newzoo, a global leader in games, esports and mobile intelligence, has revealed that consumers, when purchasing a game, want to play, view and create. Secondary, consumers what to share, communicate and trade. According to the study, this tendency can be found across all type of platform.

Hamari & Al. (2016) approached the motivation of purchase of in-game content through an empirical study. The factors and results of purchase motivation from this research can be found in Annex 9 of this thesis. The study highlights the demand for games and especially in-game contents,

is somehow dictated by the game design and by the rules that govern how the in-game items affect the game's rules.

- Results of the study show that games based on social interaction, like MMOs, will see its player base valuing in priority factors such as “Playing with friends”, “personalisation”, “giving gifts”, “avoiding spam”, “participating in special event”.
- Games based on competition tend to have a players purchasing content in order to “show off achievements”, “show off to friends and “becoming the best”. However, competition tend to be rather unimportant regarding in-game purchases. Indeed, free-to-play game are also seen as “pays-to-win”, paying to gain competitive advantages. Therefore, players looking for a competitive experience tend to not orient their choice on free-to-play game, leading to unfair advantages between casual players and the high spenders (Kimppa & al., 2016).
- Economically rational player will prioritise factors like “special offer” or “supporting a good game”.
- Games based on free-to-play, freemium, AYCE or P&PM business models, artificially limiting the gaming experience, will have a customer base orientated on content purchase related to unobstructed play, and looking for “speeding timers”, “avoiding repetition”, “reaching completion”, “continuing to play” and “protecting achievements”.

Regarding in-game purchases, “unlocking content”, independently of the essence of the game, is reported as the highest purchase intention and is not significantly associated with the volume of money spent (Hamari & Al. 2017) and can be interpreted as equally important for little and high consumer of in-game content.

Thus, developers can create in-game value leading to purchase intention, through a configuration of interplay between the game and the product sold therein, with artificial limitations such as degradation of items, artificial obsolescence or fear of losing content which has been gathered (Alha & al. 2014, Hamari & al. 2017). Hamari (2017), states that it is not a surprise that such a commodification of games is facing a resistance from several users and developers alike, as both artificial obstacles and use of players as a form of commodity belongs to the gamification process, aiming to maximise the revenue.

Past studies have found that game enjoyment have a complex relationship with willingness to purchase in-game goods (Hamari 2017, Hamari & Keronen, 2016). Player willing to continue to play the game but with a decreasing enjoyment (possibly due to aforementioned artificial

obstacles) are more likely to purchase in-game items. Therefore, developers should find a balance between the enjoyments provided in the game to retain players, but inconvenient enough, leading to more future in-game purchases. Obstructing the game might affect the experience for the majority of user but emphasize revenues from a small minority of high spenders, instead of an equal division. A recent monetisation study from the gaming industry highlights the role of a small paying minority, revealing that 48% of revenues are generated by 0.19% of players, in the mobile free-to-play and freemium games (Swrve, 2016).

Several studies investigating the relationship between virtual goods purchases and social influence (Haari 2015, Shang, Chen & Huang, 2012) found that social values, influences, presence and status have a positive association with virtual good purchases. Social interaction can be a strong incentive for a player to buy in-game content, such as boosters, to keep up with friends' pace or sending gift, strengthening relationship between player, which is a common mechanic in social network and which can be monetised (Paavilainen & al. 2016). Customisation and visual alteration also play a key role in the social dimension in games where others can easily see the customised element, which can also be highly monetised.

Emotion-based factors like “pay-to-win” might diminish the overall willingness to conduct a purchase in game or a loss of enjoyment for it (Hamari, 2015). While player that deem emotional and social aspects in games can often succumb to irrational purchases, players deeming economical aspects as important purchase reason may approach purchase decision with a more rational approach (Hamari & Al., 2017) and further, be willing to spend more money, not being influenced and limited by ideological or attitudinal resistance.

Hamari & al. (2017) believe that price level and special offers should not be neglected, both at game purchase and in-game content, as supporting the game or the developer seems to be a criteria for spending money, according to their study. Game experts have also emphasised on taking good care of social communities in free-to-play game to ensure future purchases (Paavilainen, 2016).

### **Customer loyalty and virtual community**

Becoming a member of an online community is considered fairly easy due to the low requirements needed compared to traditional communities. The emergence of internet gave limitless opportunities for people to approach and evaluates products, leading to the need for efforts in bringing new customers and retain them as loyal and profitable consumers. Indeed, loyalty plays a key role in any type of relational marketing (Griffin, 1996).

General researches on customer loyalty have provided justification for perceiving satisfaction as a primordial antecedent to loyalty, showing empirically significantly positive relationship (Newman



& Werbel, 1973, Griffin, 1996). Additional researches often suggest that loyal customers are more likely to provide positive feedback and word of mouth (Jones & Sasser, 1995) and buy more products (Berry & Parasuraman, 1991).

Regarding web-based companies, expanding market shares through online virtual community plays an important role to satisfy diversified online customers. According to Kim & al. (2004), providing an online virtual community is an effective way of retain potential customers and therefore, affecting customer loyalty.

Kim & al. (2004) believe that in order to increase customer loyalty, through online virtual communities, companies should provide the following: high stimulation level of participation through chat rooms and bulletin as members tend to like sharing their previous experiences, maintain a high interest through content and provide several opportunities to suggest personal ideas.

Like in any industry, the gaming sector finds great advantage in having loyal customers and the different steps of gamification plays a key role in the success of retention (Deckert, 2014). Few companies became masters in the art of retaining client in the videogame industry, using both strategies from common customer retention, allied with customer retention tools from the field of gaming. For instance, Blizzard Ltd (Editor/developer of Hearthstone, Overwatch, World of Warcraft, Diablo, etc.), has become highly efficient in the art of teasing its customers, not only by providing high quality games but also by creating a huge community of loyal fan, organising massive videogame events, worldwide competition, and realising movies. But such successful cases are rare.

Regarding customer loyalty in the gaming industry, as previously mentioned, the retention process mostly occurs during the game creation, through the gamification process, with different steps meant to bring retention and even addiction.

According to Berger (2013), the best example of successful use of gamification is airline rewards programs. Indeed, miles can be redeemed for free travel, free gift or hotel stay. Still, most consumer never cash in the accumulated miles. As a matter of fact, less than 10 percent of miles are actually redeemed. It is estimated that more than 10 trillion<sup>2</sup> frequent flyer miles are still in consumers account, unused (Berger, 2013). The reason people do not use them and keep racking up miles is explained by the fact that those loyalty programs are based on the natural inclinations

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<sup>2</sup> Which would be enough to travel to the moon and back 19,4 million times (Berger, 2013)



Graduate School of Management of human toward achievement and competition (which are key elements of gamification), and are highly efficient simply because consumers enjoy earning points and VIP status (Berger, 2013).

Additional researches related to airline loyalty program (Dreze & Nunes, 2006) revealed that miles incentivize consumers even if they are meaningless (most of flyers are not interested in using them leading to the fact that they are essentially meaningless). The conclusion from these research leads to the fact that gamification can turn a basic loyalty program into a very efficient one. Indeed, gamification leverages the potential of addiction to nearly any mundane task into a viral competition, for which users are recognised and highly valued when winning.

Berger (2013) highlight the danger of over using gamification. Currently considered a trend in customer loyalty, not only applying in the gaming industry but spreading in different market which are not necessarily related to digital anymore, can become a drawback if used to intensively as it might draw customers away from the primary product, in favour of misplaced rewards and badges.

Indeed, overuse of gamification will start to go wrong whenever developers or managers start to emphasize arbitrary rewards over end goals that both benefit the developers and customers (Berger, 2013). In this regards, a wide range of companies tend to miss the point of gamification, focusing on peripheral and secondary mechanics, forsaking some elements of the gamification steps that would work best for their product and losing product value along the way, ultimately losing the impact of gamification on customer loyalty.

### **Switching barriers and recovery satisfaction in digital**

The internet led to relatively low entry barriers and opened doors to many new entrants in different industries (Vatanasombut & Stylianou, 2004) while also having low barriers of exit (Valtersson, 1996). Switching barriers representing all the factors intended to enhance the difficulty or the cost for consumers to change providers (Chen and Wang, 2009).

In many cases, dissatisfied customers with online service remain loyal and may proceed with additional purchase, because they are either inactive or passive and tend to avoid change. Studies have confirmed a post-recovery satisfaction in customer's repurchase intentions (Kuo & al. 2013, de Matos & Al, 2009, Kim & Al. 2009).

According to Li (2015), they are three different levels of recovery satisfaction and repurchasing intention: High recovery satisfaction, Medium recovery satisfaction and low recovery satisfaction. The intention of repurchasing is related to switching barriers. Respondents with high recovery tend to perceive a higher loss benefit cost with lower level of attractive alternative. Moreover, they have a better relationship with online vendors than the middle or lower recovery clusters. High recovery

customers also tend to build a quality relationship with the online service or website and exhibit stronger repurchase intentions and involvement (Holloway & al. 2009), leading to the assumption that recovery satisfaction does not only come from the resolution of problems, but also from the relationship built with the customers in the online context. Procedural switching costs seem to not influence the relationship between repurchase intention and recovery satisfaction (Li, 2015). These type of costs usually being counted in time and effort, through registration process, with customers who might consider the fact of adapting to a new service provider or platform to be an inconvenient (Jones & al. 2007). Indeed, customers tend not to be bothered by additional effort in order to search product or price-related information. Inert customers also tend to have low ability to seek provider of substitution, habit being one of the main reason for customers not to change to another platform (McMullan & Gilmore, 2003, Roos, 1999).

On the other side, attractiveness of different alternatives represent an obstacle to recovery satisfaction (Li, 2015). When few attractive alternatives are available, recovery satisfaction tend to have a positive effect on repurchase intentions. On the other hand, when numerous attractive alternatives are available, the influence of recovery satisfaction on repurchase is not significant. This fact in the Internet market differs from researches in banking or hairstyling services (Juo & al, 2011), were customers cannot find alternative with as much ease as on the Web. Indeed, the wide variety of alternatives can divert customer's attention and therefore, diminish their loyalty.

According to Li (2015), companies should establish high-quality relationships with customers. Moreover, in order to exert a direct effect on the intention of repurchasing, a focus on recovery satisfaction as to be made as it strongly and indirectly affect repurchase intention. Indeed, when service failure occurs, providing responsive and timely compensation is usually insufficient to satisfy customers. While technology mediates the interaction between the online seller and the buyers, communication can be made through online Q&A, forum or online chat, in order to bargain and post-purchase evaluations. However, those tools should primarily be used in order to create a quality relationship with customer by developing a feeling of friendship, this being accomplished by sympathising with customer needs, patiently answering questions and showing concern for customers. Li (2015) states that online service provider that develop high-quality and long-term relationship with their client tend to be more reliable than the one that only focus on customer satisfaction. High quality relationship being achieved by building commitment, and facilitating mutual trust and improving communication with customers.

When service recover does not satisfy the needs of the customer, companies might consider the role of alternative attractiveness, inertia and switching cost in order to deter their clients from

switching. Indeed customer with a low level of recovery satisfaction are less likely to repeat purchase behaviour. According to Peterson and Yang (2004), the net effect of switching cost depends on the strength of the switching efforts relative the corresponding benefits. In order to counter this, firms shall increase the perception of lost benefit switching cost by providing gifts such as discounts, special deals or any type of additional services. Moreover, firms should enhance customer perception of lost benefit switching costs.

External forces can neutralise the perception of switching barriers by customers, easily being able to access a substantial amount of information on potential substitution products, such as information on product attributes, pricing, availability and value proposition. Firms should ensure to understand the competitive profile in order to provide adapted benefits to their customer to increase exit barriers and reduce the attractiveness of alternatives. In order to do so, provide high quality service or service that inherently distinct from competitors and building an image of uniqueness is essential (Kasper & Bloemer, 1995). Li (2015) advises online auction sellers to provide demonstrative advertising to make a positive impression on low-involvement buyers. Regarding the high-involvement buyers, Li (2015) advises to provide comparative advertising in order to illustrate the superiority compare to other competitors.

### **Digital involvement**

In the fast-moving business world of today, facing global competition in an environment of race for innovation and better manufacturing, competitive advantages require more than owning “difficult-to-replicate” assets. It also requires unique dynamic capabilities (Teece, 2007).

Teece (2007) stands that the success of companies depends very little on the traditional element of business, such as owning tangible assets, cost control processes, managing quality and inventories or reaching economy of scale in production and optimising any type of constraints. Instead, companies’ success depends upon research, inventions, development of ideas, intellectual property, “best practice” processes, new business models, strong and accurate predictions and any form protection against imitation by competitors. In other words, success of companies depends on their ability to shape the market.

In the videogame industry, digital distribution companies have recently reshaped the market at an unexpected speed, a perfect example of dynamic capability. Teece (2007) emphasise on three major aspect of dynamic capability; Sensing and shaping, Seizing opportunities and managing threats. Seizing and shaping are the ability to access information and find or create new opportunities through new knowledge. Companies must constantly search for new technologies

and understand the evolving needs of consumers. Thus, widely used tools such as the five forces of Porter are compromised, as they don't take opportunities of innovation into account and rather focus on shaping competition itself while mostly encouraging difficult-to-copy assets.

The process of seizing opportunities requires investment in development and commercialisation of new products, processes or services. According to the concept of increasing returns, if a network gets ahead, it tends to stay ahead, thus, significant technological, design and upfront investment are necessary (Teece, 2007).

Companies, not only in digital industries, are now seizing the opportunities provided by tools like gamification and design thinking. Such tools leads to having a more devoted customer base, ultimately spreading positive feedback, as previously mentioned (Berry & Parasuraman, 1991).

### **Digital customers management**

It is extremely important for companies in order to survive in a consumer-driven world to make best use of digital assets to manage customer, understand their needs and habits, improving loyalty, facilitating eCommerce process and developing sustainable growth. Digital customers management brings value through deployment of tools and smart usage of technologies, increasing customer satisfaction with innovative digital and cross-channel experience (trends such as bots, robots, big data, IA, self-care), implementing partners ecosystem, leverage of automation, focus on clients' needs and valuating their feedbacks.

Mulpuru (2016) made a case study, highlighting the quality of GameStop customers' management. The company was suffering from constant losses before launching the PowerUp program, leading the company to go from 1 million to 40 million users worldwide. The program based on gamification element, such as amassing points and perks, aimed to mostly gather information about customers' habits, ultimately enhancing customer experience, leading to retention.

Thanks to the gathered data, GameStop personalised the e-mails customers received, avoiding those to appear automated, calling users by name or featuring products related to their past purchases and get to know where to open new physical stores (Mulpuru, 2016). Eric Oria, Senior Director at GameStop stated that before the launch of the Power Up program, they could not tease and advertise about future game more than one month before release but since then, the company has been able to start to do so more than nine month before release, targeting customers that might be interested in the future product (Mulpuru, 2016).

Hamari & Al. (2017) highlight the vital importance of understanding the purchase intentions of customers, as some motivation could be important in only some specific types of games, while

other motivation could be missing from other games. Many successful free-to-play games have not included concept or purchase intention (see annex 10), allowing players to play as long as they want while trying to generate revenues from other monetisation mechanics, without including content to unlock. This is especially accurate for games such a World of Tanks and Team Fortress 2 (Hamari & Al. 2017).

On the other hand, these game have a high conversion rates from non-paying to paying, of around 20 to 30%, while mobile free-to-play game tend to have proportion lower than 1.5% (Swrve, 2014). This high conversion rate can be explained by a focus from developers on high spender minority accounting for the most income (Alha & Al., 2014). Such games have a fairly strong focus on social aspects of the game and management of the communities existing within, and monetise in-game acquisition of competitive items or cosmetics.

A good consumer management associated with efficient monetarisation is considered rather rare, especially for successful free-to-play games (Alha & Al., 2016). The game company Blizzard is a perfect example of successful consumer management, with their freemium cross-platform game Hearstone (Alha & Al., 2016), and PC game Heroes of the Storm.

### **Involvement in product design**

Due to the diversity of market competition and user demands, traditional products structure tend to face difficulties in meeting with the personalised demand in a cost-effective solution. According to Zhan, Peng & Gu (2015), users care most about the final function of the product which can be offered to them, therefore, there is no need to involve them in including them in complex step of product design (such as participating in the design of complex manufacturing operations or database source code). Zhan, Peng & Gu (2015) identified two way of involving customers, which are indirect involvement pattern and direct involvement pattern.

Indirect involvement only requires the user to evaluate the functions of the product, not dealing with details such as design or component. Internet is an efficient tool for the distribution of information and applications and is commonly used in most areas implying indirect involvement being a reliable tool for users to participate in a process. Web-based application for open-architecture products enhance the exchange of information between clients, designers and servers (Zhang, Pend & Gu, 2015).

Users provide feedbacks during the beta testing period and can also report problems or request changes in functions. User involvement is known to improve the platform design and promote the module development and is realised by a demand configuration, as seen bellow on Fig. 1 (Zhang, Pend & Gu, 2015).

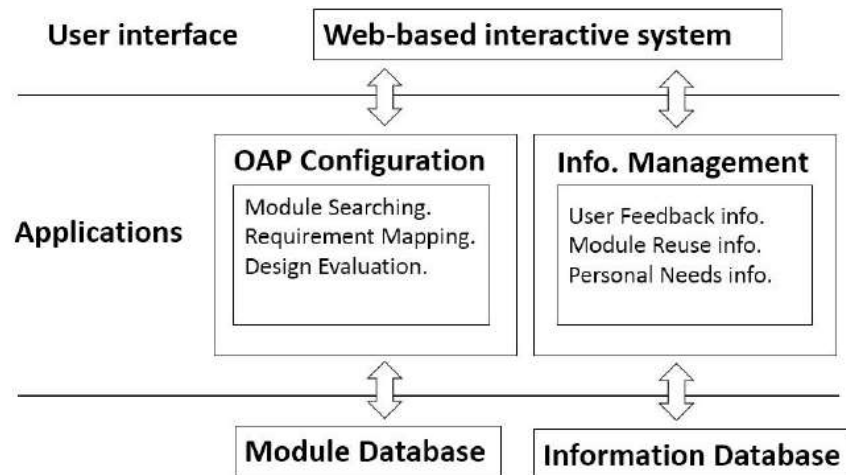


Figure 1: System architecture of indirect involvement design

Wilkinson & Angeli (2016) stated that user involvement in product design is a key factor in order to fulfil customers need, reflected by vision, smell, touches, etc. Thus, customers should be involved in design process in order to significantly improve the final product. Zhang, Pend & Gu (2015) believe that virtual reality represent the next opportunity, related to direct involvement partner, enabling the design performance for product testing in an advanced interactive environment. Nevertheless, in the videogame industry, Beta test and pre-releases already provide such an opportunity of product design.

### Online reviews

With the emergence of internet, customers became more active and empowered now being able to share the opinions and experiences related to products and services through online reviews, even in real time while experience the product ( Maslowska, Malhtouse & Viswanathan, 2017). Information provided by existing customers rather than directly from the firm is usually considered as more trustworthy (Blazevic & al., 2013). It is believed that online customer review do have an influence on purchase decision (Zhu & Zhan, 2010) and as a matter of fact on sales. Therefore, multiple companies have adopted online reviews as a way to engage customers in product design and in order to influence review's readers, leading to higher customer acquisition (Maslowska, Malhtouse & Viswanathan, 2017).

Hennig-Thurau & al (2004) have developed a typology of different online review motivations, which are the following:

- 1- Venting negative feelings
- 2- Concern for other customers
- 3- Self-enhancement



- 4- Seeking advices
- 5- Economic incentives
- 6- Platform assistance
- 7- Helping the company

Other research have found that in the online world, writing an online review follows a highly satisfied or highly dissatisfied state of mind, while those in the middle are less likely to review a product (Sun, 2010). Due to the prevalence of positive customer experience, empirical observation observed an evidence of social motivation among reviewers (Hu & al. 2010). Studies on online movie review found that reviewers are more drawn to already reviewed movies and therefore, mainstream movies usually have more online reviews than niche movies and the need to socialise dominate over the need to inform others (Dellarocas & Narayan, 2007). Additional studies related to gender and review revealed that men are more likely to post information online while women tend to have a more responsive participation (Awad & Ragowsky, 2008).

The life cycle of a product also tend to impact online review behaviour (De Maeyer, 2012). During the early stage, consumers are more focused on the attributes of the product but shifts to the benefits of the product in the late stage of lifecycle (Park & Kim, 2008).

### **Valence and volume reviews**

Different type of reviews can be found on distribution platforms. Review valence describes the number of stars given by customers to a product, informing potential customers how existing consumers evaluated the product and can help them drawing conclusion about the overall quality of the specific product (Kostyra, Reinger, Natter & Klapper, 2016).

Review volume relates to the number of written review about a specific product, which indicates the general enthusiasm, the popularity and intensity of word of mouth towards the product (Cui, Lui & Guo, 2012, Liu, Park & Han, 2008, Duan, Gu & Whinston, 2008, Liu, 2006).

The effects of those reviews are conflicted. While several studies found a positive effect from valence reviews in general (Minnema, Bijmolt, Gensler & Wiesel, 2016), on sales rank of electronics (Archak & Ghose, 2011), book and movie box office performance (Chintaguna, Gopinath & Venkataraman, 2010, Zhang & Dellarocas, 2006), sales of smartphones (Gopinath, Thomas & Krishnamurthi, 2014), consumer package goods (Maslowska, Malthouse & Bernritter, 2017), and beer (Clemons, Gao & Hitt, 2006), other studies have oppositely found that online reviews had no impact on box office performances (Duan, Gu & Whinston, 2008, Liu, 2006),

Amazon sales rank of books (Chen, Wu & Yoon, 2004) and that Valence reviews was ineffective at driving sales (Park, Gu, & Lee, 2012, Forman, Ghose & Wiesenfeld, 2008).

A similar situation is found regarding review volume. Several studies show a positively related reviews volume with sales and revenues (Bazaarvoice, 2015, Gu, Park & Konana, 2012, Matfield, 2011, Archak & Ghose, 2011, Duan, Gu & Whinston, 2008). However, other research states that the volume alone is not representative of the impact of review on sales (Gopinath, Thomas & Krishnamurthi, 2014, Clemons, Gao, Hitt, 2006).

Maslowska, Malhtouse & Viswanathan (2017) found that the valence review has a positive impact on purchase decision of health and beauty product. However, they also found that the magnitude of the impact relates or additional factors. Maslowska, Malhtouse & Viswanathan (2017) believe that the impact of valence review is marginal when only few reviews are available. Their results indicates that for reviews, quality and popularity cannot be dissociated and valence review is only valuable in high volume. Additionally, the impact of valence review tend to be steeper, even with a small increase of volume, when customers shop for a less expensive product. On the other hand, if the price of the product is high, a wide amount of negative reviews tend to reduce the purchase probability, leading the assumption that if the risk related to purchase decision is high, customers need more information to support their decisions.

Such a behaviour can be explained by the fact that customers are generally risk-averse (Kahneman & Tversky, 1979). Customers will therefore be more willing to take a risk and acquire a product not reviewed or badly reviewed if the prospective of losses is considered to be low. Zhan, Ma & Cartwright (2013) found an asymmetric impact of reviews for digital camera, with negative and one-star only reviews having a stronger effect on purchase intention than positive or five-star reviews which can be explained by the fact that the seller could passionately write fake positive reviews and therefore, potential customers will give higher credibility to negative reviews. Additional studies on online reviews in hotel found that by contrast to positive reviews, negative reviews can be seen as less fair and believable, being written soon after a bad experience and being over critical (Lin & Xu, 2017). A similar behaviour could potentially occur in the videogame industry, due to having 27% of consumer base bellow 18 years old (ESA, 2016), who might act with less maturity and less restraint or frustrated consumers acting with more impulsive behaviour following a failure in game.

According to various researches, credibility is a perceived quality and does not necessarily reside in an object, a piece of information or a person. Husan & Hung Tai (2011) defined information



credibility as “the perception of information by consumers rather than a direct measures of actual quality”.

Price, often considered to be the leading factor for purchase decision, can also influence and moderate the impact of reviews on purchase decision (Maslowska, Malthouse & Bernritter, 2017). Customers usually compare the product with a similar set of product from a related category, leading to a subjective average market price of a product for a given category (Monroe, 1973). If the product is less or more expensive than the market price, customer will perceive the price to be cheap or expensive. Product involvement is expected to be higher in case of more expensive product, due to higher purchase risk, leading to a bigger influential role for purchase decision from reviews valence and volume.

People tend to be loss averse since a loss is generally psychologically painful (Kahnemian, 2011). Therefore, in order to avoid potentially painful psychological and financial losses, customers will be more active in collecting necessary information conducting to purchase or non-purchase decision.

According to some studies, valence reviews have higher sales impact for search product rather than for experience products (Cui & Al, 2010), such as computer hardware or software. The reverse situation occurs for volume reviews, which causes a significantly bigger impact on sales of experience products (such as videogame). Thus, for experience products the review number acts as an indicator of popularity leading to purchase decision-making cue.

### **Verbal reviews**

Few studies have focused on verbal reviews, rather targeting numeric rating such as valence and volume. According to Hu & al. (2010), the rating distribution is binomial, with a majority of positive reviews and a minority of negative reviews, but the only real way of a future customer to understand the reason hidden behind numeric rating is to read and assimilate the verbal reviews, leading to a better awareness of the risks or benefits and ultimately, be better able to decided which reviews are relevant and helping to conduct to a purchase. Thus, it is expected that verbal reviews gather more information than valence and volume and improve predictions.

However, additional researches are needed in order to develop the necessary tools related to text-mining and text analysis and work with minimal human input (De Maeyer, 2012).

### **YouTube review**

Social media platforms, such as Facebook, Instagram or YouTube have unique architectures and culture (Smith, Fischer & Yongjin, 2012). YouTube, third most visited site in the world after

Google and Facebook, is being utilised in a variety of ways, not only in entertainment but also for social interaction, through comments and also seeking or providing information (Khan, 2016). In other words, YouTube has provided new way to consume, create and share digital products.

YouTube has a politic based on user-initiated action, leading to “co-creation” of value (Brodie, Ilic, Juric & Hollebeek, 2013) that comprises behavioural, cognitive and emotional aspect. Users can be clustered in two categories: passive users, who represent 90% of users of online communities (Nonnecke & Preece, 1999), only consume content by watching videos, listening music and reading comments, while not posting messages nor commenting videos. On the opposite, active users participate by commenting, liking, disliking and sharing videos (Takahashi, Fujimoto & Yamasaki, 2003).

Therefore, YouTube can be considered to converge between the traditional entertainment choices and regrouping television, music and film on a single platform based on a culture of self-promotion and self-broadcasting (Shao, 2009, Burgess & Green, 2009). Users, exposed to a myriads of videos, can subscribe to a limitless variety of channels. In addition, YouTube is known to be a learning platform for potentially anything (“How-to” videos), information seeking motive being a leading factor of media use, with people providing tutorials and reviews on any potential product or services (Cayari, 2011). According to Smith & al. (2012), firms increasingly rely on YouTube, not for promotion and marketing only, but also for consumer’s feedback.

### **Streaming**

Online live streaming is a new genre of media combining broadcast activity with cross-modal video-mediated communication (Recktenwald, 2017). Having gone through several industries, such as cooking or painting, online live streaming of videogame currently has the highest numbers of viewers and broadcast and generate the highest revenues, the main platform being Twitch.

Several studies found a positive tendency for information seeking (“let’s play” and “review streams”) motivation on Twitch (Sjöblom, Törhönen, Hamari, Macey 2017, Sjöblom & Hamari, 2017, Hamilton et al., 2014), both for information about the game or learning how to play.

Sjöblom, Törhönen, Hamari, Macey (2017) states that in the search for information, learning how to play remain a small segment, as gamers usually seeking information in order to learn about games as products, and much less about the gameplay itself. Categories like “let’s play” and “casual streams”, focusing on a less formal review of the game content tend to be highly requested. Indeed, spectators can communicate and interact with the streamers, ask them specific questions and requests which highly strengthen the search for high quality information related to the product. Sjöblom, Törhönen, Hamari, Macey (2017) argue that the concept of streaming act like a positive

word-of-mouth coming from a friend, highly valued and considered high quality review by potential consumers.

According to Sjöblom, Törhönen, Hamari, Macey (2017), Stream review tend to suits action game best in information seeking which have a fairly high price at release date. Additionally, they argue that streaming fills extremely well the need of information related to a product, especially when looking for a specific genre as the streamer can recommend additional games.

## **Presentation of the part of the world to be studied**

Abundant researches have been conducted on the impact of reviews features, such as valence, helpfulness, or volume, and the results from those studies tend to be mixed (Maslowska, Malhtouse & Viswanathan, 2017). Indeed, previous researches have not demonstrated a clear relationship between online reviews and sales of the products, rather focusing on business context (Maslowska, Malhtouse & Viswanathan, 2017). In addition, previous researches focused on online reviews regarding material products or, if related to digital industry, books or movies (Maslowska, Malhtouse & Viswanathan, 2017, Rosario, Sotgiu, De Valck & Bijmot, 2016, Trenz & Berger, 2013). Researches investigating the impact of online reviews on the digital industry have been rapidly growing but the understanding of their effect and potential remains limited as of today.

According to Maslowska, Malhtouse & Viswanathan (2017), one of the main reasons for such limitation might be explained by the limited number of product categories previously studied, which could also be related to the restrained access to data on digital products and lack of interactions between features of online reviews (Kostyra, Reiner, Natter & Klapper, 2016, Rosario, Sotgiu, De Valck & Bijmot, 2016, Trenz & Berger, 2013). Maslowska, Malhtouse & Viswanathan (2017) also believe that the effect of online review can be influenced and differ based on the product price.

The video game market, which is digital by nature, has a long experience of digitising in-game content, business models and distribution. The videogame industry has now been subject to a wide range of researches, through psychological impact of gaming, business models or gamification, but the amount of researches analysing the impact of reviews on purchases of videogames remains fairly limited, in an industry expected to now highly depends on customer reviews in order for customer to estimate a game value, after the shortening of the value chain with the rise of digital distribution.

In addition, existing researches on reviews impact mostly approach quantitative indicators such as review valence or review volume, while reviews now take several form, not only through written

forms but also videos posted on social media. Customer involvement, through beta phase and early access leading to customer feedback and reviews from customer during the game design process is also subject to a lack of research in the field.

## **Research Design**

The initial part of this thesis, approaching the recent background of the market of videogame has revealed an extremely fast growing and profitable industry, overtaking every other digital markets, experiencing new distribution systems and business models, with highly efficient product method design leading to potentially highly addictive products. The growth of the market, the complete reshape of value chain in less than 5 years outdated several existing researches, the current trends of gamification used by several industries and inspired by the tetrad gamification element of videogame design highlight the need of up to date studies in the field of digital videogame distribution.

The literature review, covering the aspects of customer behaviour and involvement, purchase intention and the different type of review has revealed a need for research regarding the impact of reviews on digitally distributed videogames. Indeed, while several studies related to videogames approached purchases intentions, business models and several psychological impact of videogames and while studies related to customer review approach the impact of review on movies or material good sold on digital platform, the number of study on the impact of reviews on digitally distributed videogame remains almost inexistent.

Hence, the main objective of this thesis is to understand how written reviews, video reviews and customer involvement interact with each other to influence purchase decisions of videogame.

## **Methods**

The primary data source comes from a Web API provided by Valve, owner of the digital distribution gaming platform Steam, which holds more than 75% of market shares for PC game (Cliff, October 2013). The dataset used in this thesis is therefore accessible to the public and does not infringe or breach any confidentiality.

In order to conduct the analysis, the dataset is taken based on games released between the 1<sup>st</sup> of January 2017 and the 31<sup>st</sup> of March 2017. The following sample has been taken in order to focus on the “Top 100 Trending games” from the digital distribution of videogame Steam, showing the most popular games from the recent releases. Moreover, it takes into account several independent games which are expected to depend on customer feedbacks, instead of focusing only on blockbuster benefiting from strong marketing investments.

Additionally, this 3 months period does not have any “Steam Sale”<sup>3</sup>, avoiding peaks of purchases and peaks of game acquired for free, often leading to a huge drop of game owner at the end of the limited free access, which could biases the dataset and the impact of review during the early step of the released products.

A cluster on a period of time, rather than starting at the release date of the game gives the possibility to analyse the impact of Beta and Early access to the game, leading to various feedback already available pre-release.

### Dataset

- Owner: The data related to owning the game mostly reflects the game purchases but also take some additional elements. Indeed, it is named as “*owner*” as it takes into account the number of people owning the game on their Steam account and not only the people who have purchased the product. As a matter of fact, it includes all game purchased on steam platforms, all games purchased in retail but activated on Steam<sup>4</sup>, games purchased in bundles and also game received through promotions or gifts. Therefore, while representing the number of customer owning the game, it cannot serve as indicator of profit with the selling price of the game. However it serves as an indicator for gamers to actually possess the game. As a matter of fact, gaming business model include Free-to-play or Freemium and as such, a free download can be considered a purchase intention, according to the business model of the company. Therefore, this research consider *owner* to be a purchase<sup>5</sup>
- Audience: This dataset represents the proportion of owner actually playing the game. This dataset is highly correlated to *Owner*, as a person purchasing a product is likely to use it. On the other hand, a player receiving the game as a gift or having a free access due to winning a beta access or the game for free could decide not to use the product as no purchase was conducted, explaining a difference between owner and audience
- Release date: The official date of release of the product
- Beta/early-access: The *beta/early-access* shows if the game provided a Beta or an early-access pre-release to the game.

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<sup>3</sup> Steam Sales represent a discount period, usually being a week-long deal and most commonly for the Steam Summer Sale, Halloween Sale, Black Friday sale and Christmas sale, with popular games at a discount price up to 90% off of free accesses on a seven day period.

<sup>4</sup> Due to the « grey market » of game keys, several games now are sold not using a key anymore, but an activation system linked with the steam platform.

<sup>5</sup> A game can be purchased only once per Steam account, therefore, on purchase accounts to one customer acquisition.

- Twitch videos: This dataset is related to all channels broadcasting the game live, on a daily basis on Twitch
- Twitch views: This dataset represents all views of the live video of the game from a twitch channel, on a daily basis
- YouTube videos: represents the number of videos related to the game, uploaded on YouTube, on a daily basis
- YouTube views: represents the number of views of videos of the game on YouTube, on a daily basis
- Positive review: represents the number of positive written reviews of a videogame on the Steam platform, on a daily basis
- Negative review: represents the number of negative written reviews of a videogame on the Steam platform, on a daily basis

### Sample

The sample of data is based on 100 different videogames. Data mining was done with an API gathered by Valve, and from SteamSpy, which pulls data every minute and update them once a day, at night (GMT +2). The data are based on several days' samples. The API gathers data from millions of gaming accounts, but as the data are updated only once a day, it is known to have a margin error usually from 0.1% to 2%, depending respectively on the time of data upload and game release (the most recently released a game is, the most likely it has to face a margin error higher than 0.1%).

Verbal reviews follow the binomial distribution range mentioned in the literature review, with a majority of positive reviews and a minority of negative reviews. According to the purpose of this research, it was decided to limit the verbal reviews to their binomial distribution, avoiding a qualitative analysis of the review content.

The data are separated into two dependent variables and ten independent variables.

- Owner: The dependent variable *Owner*, being considered as “purchase” of videogame for this study, due to the intention of purchase but varying according to the business model of the product, is the key factor of our research aiming to analyse if it his impacted by customer reviews and customer involvement. The cumulated amount of purchases of the 100 videogames accounts for 335'993'964 during the period from the 1<sup>st</sup> of January 2017 and the 31<sup>st</sup> of March 2017





- Audience: The dependent variable *Audience* depends on purchases and as such, will not be a factor of influence of purchases, but can be an indicator of cross-side positive network effect as people can later be influenced by the size of the community to purchase a product. The cumulated amount of *Audience* of the 100 videogames accounts for 249'620'507.
- Release date: This independent variable is mainly needed in order to compare the purchases at the date of release, for the 100 games.
- Beta/early-access: This independent variable is valuable for the study as it give the possibility to compare the impact of customer involvement through Beta and early-access, leading to written reviews and feedbacks and videos pre-release and compare to game released without beta and early-access. A dummy value is used, "1" for videogames with beta and "0" for games without beta. In our sample, we have 50 games which provided a beta or early-access and 50 games which did not.
- Twitch videos: This independent variable is valuable for this study as it represents a new type of customer reviews, not in written form anymore, but through live video on a channel, providing a more in depth review to the audience, showing gameplay, giving point of view and interacting at the same time with the viewers. The choice of focusing on Twitch only for live video is explained by the popularity of the website and focusing only of streaming of videogame. The cumulated amount of *Twitch videos* of the 100 videogames accounts for 45'241 during the period from the 1<sup>st</sup> of January 2017 and the 31<sup>st</sup> of March 2017
- Twitch views: The number of daily views of a channel broadcasting video review live, independent variable, is valuable for this thesis, as the number of viewer can be a potential indicator of review impact and may drive purchases intention. The cumulated amount of *Twitch views* of the 100 videogames accounts for 3'091'533 during the period from the 1<sup>st</sup> of January 2017 and the 31<sup>st</sup> of March 2017
- YouTube videos: This independent variable is valuable for this study as it represents video reviews providing a more in depth review to the audience, showing trailer of the game, gameplay trailer, and various videos of people reviewing the game. YouTube being the 2<sup>nd</sup> largest search engine and 2<sup>nd</sup> most visited website in the world, it provides enough data for large samples. The cumulated amount of *YouTube videos* of the 100 videogames accounts for 708'526'967 during the period from the 1<sup>st</sup> of January 2017 and the 31<sup>st</sup> of March 2017
- YouTube views: The number of daily views of *YouTube videos* related to the game, independent variable, is valuable for this thesis, as number of viewer can be a potential

indicator of review impact and may drive purchases intention. The cumulated amount of *YouTube views* of the 100 videogames accounts for 1'513'928'363 during the period from the 1<sup>st</sup> of January 2017 and the 31<sup>st</sup> of March 2017

- Positive reviews: The independent variable *positive reviews* is necessary for this thesis, in order to analyse the written reviews. The cumulated amount of *Positive reviews* of the 100 videogames accounts for 57'276 during the period from the 1<sup>st</sup> of January 2017 and the 31<sup>st</sup> of March 2017
- Negative reviews: The independent variable *negative reviews* is necessary for this thesis, in order to analyse the written reviews. The cumulated amount of *Negative reviews* of the 100 videogames accounts for 12'856 during the period from the 1<sup>st</sup> of January 2017 and the 31<sup>st</sup> of March 2017

### Hypotheses

Based on the existing literature on digital consumer behaviour and purchase intentions, customer involvement and online reviews now taking different shapes, three different hypotheses arose.

Formally, based on the literature, I would predict,

- **Hypothesis 1.** Companies involving customers through beta test phase and providing early-access soon before official release date have higher sales at release date
- **Hypothesis 2.** Online reviews have a positive impact on videogames purchases
- **Hypothesis 3.** Reviews provided through videos have a stronger impact than written reviews on purchases of videogame

### Measures

To analyse the impact of customer involvement and customer reviews on purchase of videogame, I built statistical models using the Software State, followed by Watson Analytics.

*Customer involvement.* I used the *Beta/early-access* factor as an indicator of customer involvement and compared it to the purchases at the release date using a dummy value (1= “the games has a *beta/early-access* previous to *release date*” and 0=”the game does not have a *beta/early-access* previous release date). I then used Stata to build statistical regression models in order to analyse if involving the customer through beta test lead to better sale at the date of release of the game.

*Impact of customer reviews and involvement on purchases.* This construct was analysed on Stata, through the creation of a hierarchical database model in order to visualise the correlation between



our independent variables and the purchases. The dataset was reorganised in a two-level structure with individual sales per date at level 1 and games at level 2.

The overall mixed model equation to be fitted is as follows:

$$\begin{aligned} Owner_{ij} = & \beta_0 + \beta_1 Twitch_{ij} + \beta_2 Y_{video_{ij}} + \beta_3 Y_{views_{ij}} + \beta_4 Positive_{ij} + \beta_5 Negative_{ij} + \beta_6 Beta_{ij} \\ & + \beta_7 Released_{ij} + \beta_8 Released_{ij} * Twitch_{ij} + \beta_9 Released_{ij} * Y_{video_{ij}} + \beta_{10} Released_{ij} * Y_{views_{ij}} + \\ & \beta_{11} Released_{ij} * Positive_{ij} + \beta_{12} Released_{ij} * Negative_{ij} + u_i + \epsilon_{ij} \end{aligned}$$

$i = 1, \dots, 100$  games and  $j = 1, \dots, n_i$  dates, where  $u_i$  is a random effect (intercept) at the game level. In addition, the interaction terms between the independent variables and Released dummy are included. As in previous model, games with beta takes on a value of 1 and 0 if it was not released with a Beta.

An interaction terms was created as the *release date* was not the same for all the games. So we have released = 1 if the date is from/past the *release date* and released = 0 if the game was not released yet. This was a way to account for the 0 sales, not because of customers not being interested in buying the game, but because the game was unreleased and therefore, not purchasable.

Thus, the model, following a Poisson distribution looks at each individual games/dates and then looks at the individual variables and act as a vector of values. It then gives an overall relationship/trend which is not per game anymore.

After an initial test of correlation, the independent variables *Twitch videos* and *Twitch views* revealed a case of multicollinearity, increasing the standards errors of the coefficients. Fearing an impact on the other independent variables, due to an overinflated standards error, we removed the independent variable *twitch views*, and kept only the variable *twitch videos*, accounting as number of live review in order to facilitate the interpretation of the coefficients.

The dependent variable *Audience* was also removed from the models. Indeed, while purchase was expected to be driven by factors such as early-access and customer reviews, *Audience* depends on the fact of owning the game (i.e. A gamer can only consume the game after having purchased it) and therefore, while purchase intention is driven by factors related to marketing and advertisement, the consuming intention is related to having acquired the product, and to several other factors (Da Silveira Espinoza, 2009).

*Impact of customer reviews, global trend.* Finally, in order to remove the impact of the different releases dates, beta and early access, the 100 games were collapsed across games and dates, in order to find a global trend. In other words, the collapsed dataset provided the relationship between reviews and a Product X, composed of the 100 games, masking the fact that games are released at

different times as well as any potential differences between games. IBM Watson Analytics was then used to create a prediction model on the impact of reviews of *Owner*.

## Results

### Customer involvement

H1 predicted an increase of sales at release date, due to customer involvement pre-release through Beta phase and early-access to the game. Before conducting the independent samples t-test, the assumption of normality was tested visually through the histogram, as well as by applying the Shapiro-Wilk test. The results revealed that the data was not normally distributed in the early release group,  $Z = 7.051$ ,  $p < 0.001$ , or in the non-early release group,  $Z = 7.157$ ,  $p < 0.001$ . Thus the independent samples t-test was not appropriate (table 3 & Annex 14).

Table 3: effect of Beta/early-access on purchases at release date, Shapiro-Wilk test

Variable	obs	W	V	Z	Prob > z
1 Beta/early-access					
0 Beta/early-access					
Histogram release date by beta					
Release date	50	0.39031	28.673	7.157	0.00000
Release date	50	0.41986	27.283	7.051	0.00000
Release date	0	.	.	.	.

The non-parametric alternative was the two-sample Wilcoxon rank-sum (Mann-Whitney) test. The chi-squared  $\chi^2$  test equals to 12.752 and a probability of 0.0004 and chi-squared with ties equal to 13.143 and a probability equal to 0,0003, leads to rejecting a potential null hypothesis ( $H_0$ ), as :

$$p \leq 0,05$$

Table 4: Two-sample Wilcoxon rank-sum, by Beta/early-access

Beta/early-access	obs	Rank sum	expected
0	50	2007	2525
1	50	3043	2525
Combined	100	5050	5050

The results indicated that there was a statistically significant difference between the two groups, with early release having a larger owner value than the non-early release games,  $Z = -3.625$ ,  $p < 0.001$  (Annex 14).

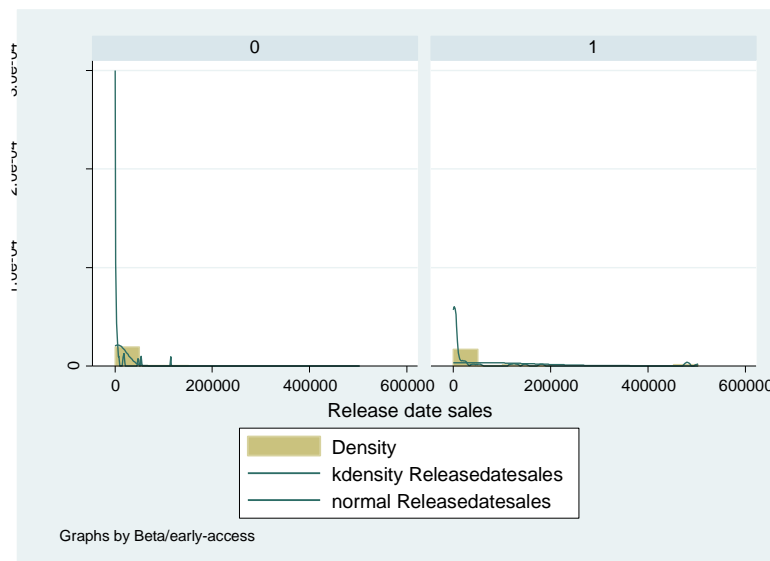


Figure 2: Impact of Beta & Early-access at release date

### Mixed model on customer involvement and review

As the data was not normally distributed, the Pearson correlation was not appropriate. Instead, the Spearman's non-parametric test was employed to determine the relationships between variables of interest in the study. The results indicated that there was a weak negative relationship between Twitch video and Owner ( $r_s = -0.026$ ,  $p = 0.013$ ), as was between Twitch views and Owner ( $r_s = -0.021$ ,  $p = 0.041$ ), and Positive reviews and Owner ( $r_s = -0.030$ ,  $p = 0.004$ ). There was a medium positive relationship between early release dummy variable (beta) and Owner ( $r_s = 0.303$ ,  $p < 0.001$ ). In addition, there was a strong positive relationship between Twitch video and Twitch views ( $r_s = 0.957$ ,  $p = 0.000$ ). This strong relationship over  $r_s = 0.8$  indicates that one of the variables should not be included in the model due to multicollinearity.

	Owner	Audience	Tvideo	Tviews	YVideos	Yviews	Positive	Negative	Beta
Owner	1.0000								
Audience	-0.0159	1.0000							
	0.1251								
Tvideo	-0.0259	0.6899	1.0000						
	0.0126	0.0000							
Tviews	-0.0212	0.6838	0.9574	1.0000					
	0.0405	0.0000	0.0000						
YVideos	-0.0081	0.4742	0.5694	0.5555	1.0000				
	0.4328	0.0000	0.0000	0.0000					
Yviews	-0.0082	0.4337	0.5046	0.5045	0.9020	1.0000			
	0.4310	0.0000	0.0000	0.0000	0.0000				
Positive	-0.0297	0.7307	0.6053	0.5825	0.4070	0.3557	1.0000		
	0.0042	0.0000	0.0000	0.0000	0.0000	0.0000			
Negative	-0.0175	0.6580	0.5481	0.5256	0.3787	0.3363	0.7307	1.0000	
	0.0909	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
Beta	0.3030	-0.0426	-0.0440	-0.0333	-0.0090	0.0059	-0.0512	-0.0452	1.0000
	0.0000	0.0000	0.0000	0.0013	0.3850	0.5679	0.0000	0.0000	

The following test was conducted with a Null model, in order to avoid a null hypothesis  $H_0$ .

Table 6: Null model

Owner	Coef.	Std. err.	z	P> z	[95% Conf. Interval]
_cons	36990.83	999.9685	36.99	0.000	35030.92 38950.73

Random-effects Parameters	Estimate	Std. Err.	[95% Conf. Interval]
var(Residual)	9.30e+09	1.36e+08	9.04e+09 9.57e+09

The Poisson mixed model could not be fitted yet, and as such the normal mixed model was applied artificially. The *Owner* variable had to be transformed using the log transform function, as the table 5 revealed that the data was left skewed (Annex 15).

To account of the zero values before *release date*, due to the game not being purchasable (despite Beta and early access), the transformation was  $\log(\text{Owner}+1)$ . The random effect comes from

observations being clustered within individual games. By comparing the simple model where the only explanatory variable is the game clustering and the H0 null hypothesis (where there is no explanatory variable, assumes all the variability in sales is due to random chance), one can determine if indeed the nested structure is better.

In the case of the game data, the sales data are clustered into games, so that sales for a particular game are more alike than sales from a different game. Each game has its' own intercept, but the same slope for sales in the regression lines. The expected *Owner* purchases for a game is on average 2.583 – across all games (the constant term in the model), but it varies from one game to another by 8.767 (the constant term under the random-effect parameters). So there is substantial variation in game sales as denoted by the Owner variable between different games.

Table 7: Model with Random Effects Only

Owner	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
_cons	36990.83	8876.57	4.17	0.000	19593.07	54388.58

Random-effects Parameters		Estimate	Std. Err.	[95% Conf. Interval]	
Game: Identity					
	var(_cons)	8.767031	1.24815	6.632362	11.58876
	var(Residual)	5.450104	.0803792	5.294818	5.609943

LR test vs. linear regression: chibar2(01) = 16752.93 Prob >= chibar2 = 0.0000					
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In the mixed model with *Owner* transformed into log (Owner+1), the results indicates that reviews did not influence the sales before or after the release of the games. The coefficient column indicates what the increase in the Owner variable would be if one increases the independent variable (for example, Positive) by one. This should only be reported if the independent variable was a significant predictor for Owner (not the case for the Positive variable, as an example). The normality is improved, although the transformed zero values are still outside the normal curve so we can see that the model still suffers from the different released when giving a global trend.

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Table 8: Mixed model, Impact of reviews and involvement

LogOwner	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
Tviews	8.59e-06	.0000134	0.64	0.520	-.0000176	.0000348
YVideos	-.0004047	.0004138	-0.98	0.328	-.0012158	.0004064
Yviews	1.76e-08	.62e-08	0.49	0.627	-5.34e-08	8.87e-08
Positive	.0012561	.0016521	0.76	0.447	-.001982	.0044941
Negative	-.0082475	.005393	-1.53	0.126	-.0188176	.0023227
Beta	2.668929	.5946536	4.49	0.000	1.503429	3.834428
Released	6.593554	.0625706	105.38	0.000	6.470918	6.71619
Released#c. Tviews	4.21e-06	.0000216	0.19	0.846	-.0000381	.0000465
Released#c. YVideo	.0026231	.0032274	0.81	0.416	-.0037024	.0089487
Released#c. Yviewsa	-1.44e-07	8.00e-08	-1.79	0.073	-3.00e-07	1.32e-08
Released#c. Positive	-.0019591	.0024697	-0.79	0.428	-.0067996	.0028813
Released#c. Negative	-.0001959	.0071193	-0.03	0.978	-.0141495	.0137577
_cons	1.775102	.4123877	4.30	0.000	.9668372	2.583367

The results of the mixed model indicated that only the beta and released variables were statistically significant. Thus, when the game was available in early access or a beta version, the *owner* variable increased by 2.669. Similarly, when the date was passed the *release date*, the *owner* variable increased by 6.593. All the other variables were not statistically significant, indicating they do not influence the *owner* variable at the period of release.

However, this model, as previously mentioned, suffers from the different release dates of the sample and while being an interesting model to show a stronger impact from customer involvement at the date of release than customer reviews, it lacks relevance in order to show the impact of customers reviews in a broader trends and correlation between them.

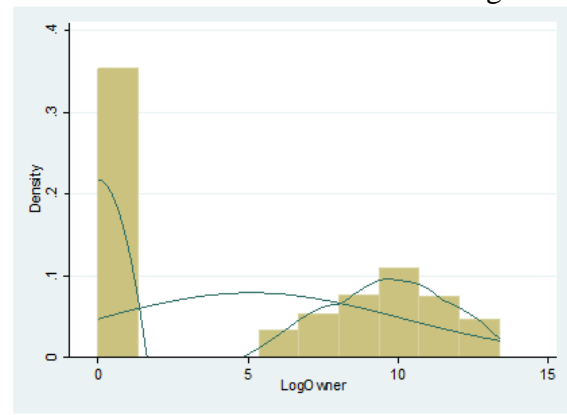
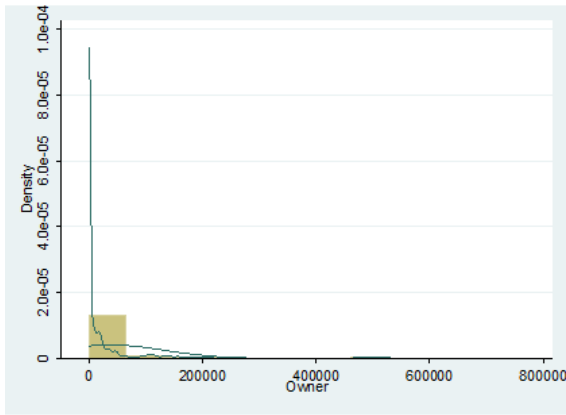


Figure 3: Mixed model, graphical result for Owner & log (Owner+1)

### Impact of customer reviews, global trend.

The results from the prediction model created with IBM Watson Analytics reveals fairly different results on the impact of customer reviews, once we regroup all games into one single global trend, masking the different release date negatively impacting the previous models. The new prediction models highlights 12 positive correlations between variables (Annex 19).

The prediction model was first focusing on One Field association, in order to see the influence from the separated variables on the *owner* variable and 6 predictive strengths were found by the model. The regrouped variable *owner* being a continuous target, a linear regression (ANOVA), based approach was used.



Figure 4: Prediction model, One Field association

The variables *Twitch videos* was the strongest driver for *owner* (Annex 20), with a predictive strength of 84%. The H0 null hypothesis in which the *owner* means are equal across the levels of *Twitch videos* was rejected by the statistically significant F values (F=119,25). In addition, a very strong positive correlation (r=0.91) was found between the two variables.

*Positive* and *negative reviews* both accounted to 75% as predictive strength (Annex 21 & 22). The two H0 null hypotheses in which the *Owner* means are equal across the levels of, respectively, *Positive Reviews* (F=67.79) and *Negative Reviews* (F=66.84) were rejected by the statistically significant F values. The models reveals different positive correlations, with *positive reviews* and *Owner* (r=0.90) and *negative reviews* and *Owner* (r=0.84) and implies that while all games are equally driven by the two type of written reviews, the negative reviews tend to be distributed in a slightly less equal proportion, with a higher proportion for games failing at convincing the *audience*.

The variable *YouTube videos* drives the *Owner* variable with a predictive strength of 67% and also have a strong positive correlation (r=0.76), (Annex 24). The H0 Null hypothesis in which the *Owner* means are equal across the levels of *Twitch videos* was also rejected with a significant F value of 44.92.



The number of views of *YouTube videos* and *Twitch channel* drive the variable *owner* with a respective strength of 58% and 48%, which is less significant and can also account to the popularity of the game (Annex 24 & 8.25).

The prediction model was then applying all potential combination between variables impacting the *Owner* variable and 13 additional sources of influences on the *owner* variable were found (Annex 26). The linear regression (ANOVA), based approach was also used for the predictions.



Figure 5: Prediction model, Combination

Through combinations, the model reveals that the interaction between the variables *YouTube videos* and *Twitch videos* drives *owner* with a predictive strength of 89% (Annex 27). For both variables, equal frequency binning was performed, ensuring that the bins approximately contain the same number of records, optimising the analysis. The results of the combined effect of these two variables has more influence than the respective sum of their main effects<sup>6</sup> and reveals a very strong impact from videos on purchase intention in the gaming industry.

The interaction of *positive reviews* and *negative reviews* drives *owner* with a predictive strength of 81% (Annex 28). Watson analytics reveals that *owner* is more impacted in case of high amount of *positive* (>1'107) and *negative* (>224) reviews or in case of low amount of *positive* (<216) and *negative* (<51) reviews, and a lesser impact for medium amount (Annex 28).

<sup>6</sup> Independent influence on the Owner variable

Several other combination are found by Watson Analytics (Annex 26), such as *YouTube videos* and *Negative reviews* (predictive strength of 88%) or *Twitch videos* and *YouTube views* (predictive strength of 88%). It is unlikely that a new video on a twitch channel will increase the number of view of *YouTube videos* and therefore, the combinations have to be taken carefully. On the other end, those association from different sources of reviews can highlight a cross-side network effect, showing the will of customers to be searching for additional information and evolving between the various sources and forms of information and reviews available. Therefore, these combination and correlations between variables can show a global impact from the various type of reviews on purchase of videogame.

## Discussion

The models used investigated the impact of customer involvement and online customer reviews on purchases of videogame and showed several important findings and confirmed the hypotheses.

**Hypothesis 1.** *Companies involving customers through beta test phase and providing early-access soon before official release date have higher sales at release date*

The study first confirmed the H1 hypothesis and revealed the importance of implicating customers in the game design, through Beta and early access, as it results in higher sales and can guarantee an already existing community at the release date, which is highly needed by MMOs and most online games.

The founding off this thesis also highlights an important potential key factors of success for independent games from smaller individual companies lacking funds for advertisement. Indeed, customer involvement reveals to be successful in order to create an already existing customer base and drives purchases at the release of the game. A customer base firmly active in providing feedback and reviews can definitely help spreading the word and act as word of mouth and network externality.

The impact on sales of beta and early-access can explain the success of independent games such as Minecraft or Prison Architects, which have provided Alfa, Beta and early access for free or very low price, benefiting from feedbacks and reviews from consumers playing the unfinished game along the game design, leading to a better final product released later at full price, but also upsurge the curiosity of other potential buyers and driving their purchase intention due to demand-side economies of scale.

**Hypothesis 2.** *Online reviews have a positive impact on videogames purchases*

Secondly, the study reveals through another model the influence of online user reviews on the purchase intention of videogame in the digital industry and positively confirm the H2 hypothesis.

Though the *audience* variable was removed from the models, a primary observation was still conducted and the difference between the cumulated *Owner* variable and *Audience* variable highlight some interesting findings, opening potential areas of research. While being perfectly correlated ( $r=1$ ), we can still easily see that several customers do not actually play the purchased games (see Annex 12). A first glance at the data available on SteamSpy on the most popular game played shows that the gap between *Owner* and *Audience* tend to be smaller and more stable over time.

Some primary assumptions would be that a download of a game for free (free to play business model or free access to beta) or games acquired in bundle, implies a purchase intention but does not necessarily lead to a consuming intention, as no cost (i.e. money, effort, etc.) was required to acquire the game. Additionally, due to network externality, the size of the audience can act as a driving force of purchase intention and consumption intention for customers.

The variables *Twitch videos* was the strongest driver for *Owner* which is really interesting as the live stream can be considered as the highest quality type of reviews, as a gamer is playing the game, giving his point of view to the audience of the live stream but mostly interacting with the viewers who can ask questions on the game. It is most likely that a gamers watching Twitch Channels to get an opinion about a game will lead to a purchase due to the quality of the review but also to the media channel still being fairly specific and can account to an already existing strong interest in a specific game from a future customer.

**Hypothesis 3.** *Reviews provided through videos have a stronger impact than written reviews on purchases of videogame*

Videogame consumption now being digitalised and consumers being aware of the various means of digital information, it is highly alike that before conducting a purchase a buyer has watched videos of the game. Therefore videos can probably be considered to be the Key driver for purchase intention in digital distribution of videogame and the results of the study confirm the H3 hypothesis.

It is also shown in the Watson model that both Negative and Positive reviews have an equal strength on purchase intention in a global trend while the mixed model taking games separately

reveals a stronger impact from positive reviews. While negative performances on an attribute have generally a stronger effect on purchase intention than a positive performance (Mittal & al. 1998), negative reviews seems to have a more moderate effect in the videogame industry probably due to the strong recovery satisfaction mentioned in the literature review, the quality of the negative reviews which can be low (low maturity of user or lack of moderation) and to the variety of type of reviews available lightening the weight of negative reviews..

The written reviews driving owner with a higher predictive strength in case of low or high volume, but less accurately in case medium volume is an interesting finding as it can demonstrate the impact of high quality written feedback and reviews available during early access and beta phase from a devoted and more curious customer base and thus, acting as strong driver for purchase intention. Oppositely, the high volume of reviews can help customer understanding the global appreciation of the game from the community and can most likely expect to have a similar gaming experience. Medium volume on reviews can be confusing due to a potential variety of reviews but still lacking volume for the potential buyer to make his own prediction on the accurateness of the product to fulfil his needs, leading to customer perplexity and less clear understanding of the expected experience provided by the game.

### **Limitations of the research**

Due to the limited resources and limited access to data depending on private companies' will to freely and benevolently share their data (Kostyra, Reiner, Natter & Klapper, 2016, Rosario, Sotgiu, De Valck & Bijmot, 2016, Trenz & Berger, 2013), this study faces several limitations. First, the duration of 3 month of the sample is rather short and while giving an overview in the early life of the game, when several purchases are conducted, a longer sample would be valuable in order to analyse Betas and impact of reviews on a longer period of time, both pre-release and post-release, until the number of purchases reaches a top.

The study mostly suffer from the different releases dates, which makes it hard for the models analysing game separately only to later find a global trend to accurately use the statistic distribution models, even with logarithmic transformations and the integration of release date with dummy values. The main reason is that the sample is not aligned on release dates, which would have been interesting to do such as *day-3 day-2 day-1* pre-release and *day 1, day 2, day3 ...etc.* post-release, instead of the real daily measure of time. But in order to do so, as mentioned before, it would require a sample with a longer duration in order to have enough games and a period long enough to conduct analysis and have the possibility to align all games by release date, which was not

doable for this thesis due to the limitation of the API used to gather the data focusing only on 3 month.

All the zero pre-release have impacted the result of the mixed model despite the use of dummy values accounting for the released/unreleased period. It has to be noted that even in case of aligning the games, an impact can be find due to the different periods of Beta test phase and the more distant we are from release date, the stronger it can impact the model.

## Conclusion

To the best of my knowledge, this research is one of the first attempting to connect customer involvement and online consumer-generated reviews with the purchases of videogames. In addition, taking *YouTube videos* and *Twitch channels* as a type of reviews is a new approach and goes beyond the usual analysis on review valence or reviews volume seen in other studies on impact of reviews and has identified several significant findings.

This thesis highlights the impact of customer involvement and impact of reviews in an industry lacking research, while being dependent on such factors due to the shortening of value chain which can impact the perception of value from customers. The main theoretical implication is related to video reviews. While most studies aiming to analyse reviews focus on written reviews, studies do not yet take video reviews into account. My thesis revealed the impact of reviews through video to have a stronger impact on sales, as videos are more likely to lead to an upsurge of purchases of videogames but also probably in experience good in general.

This thesis also revealed the important of customer implication through game design, as it has a positive effect on sales at the release of the product and leads to more reviews pre-release. While written reviews are known to be taken into account by companies (use of fake reviews, removal of damageable reviews on their website, etc.), this research reveals that videos related to the product have to be taken into consideration by companies as they impact sales even more. In addition, customer involvement will benefit to small companies and independent games lacking fund for advertisement.

In conclusion, the context of this study makes it unique from prior work and the findings make a significant contribution to ongoing work in the domain of online reviews and especially, in the fast evolving videogame industry.

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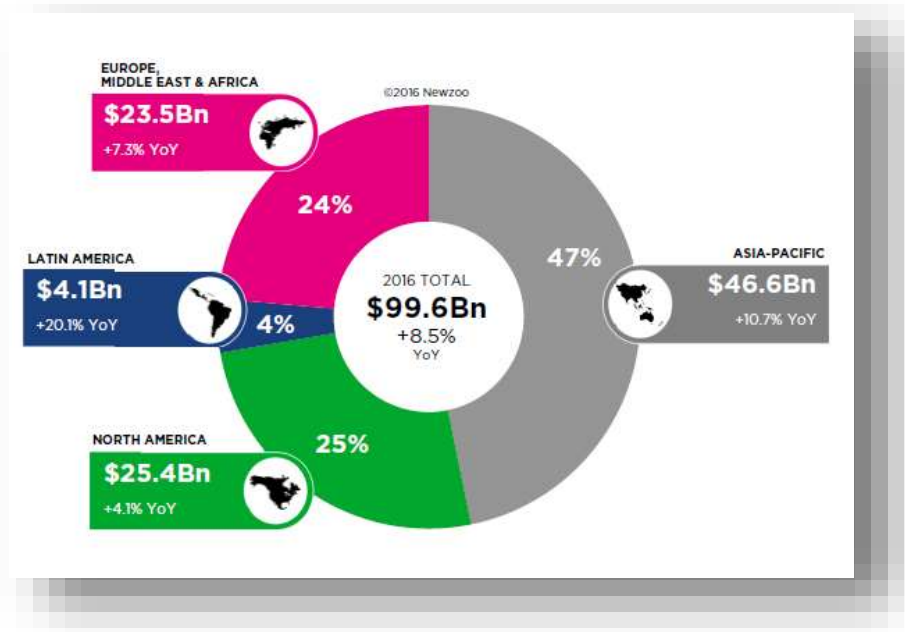
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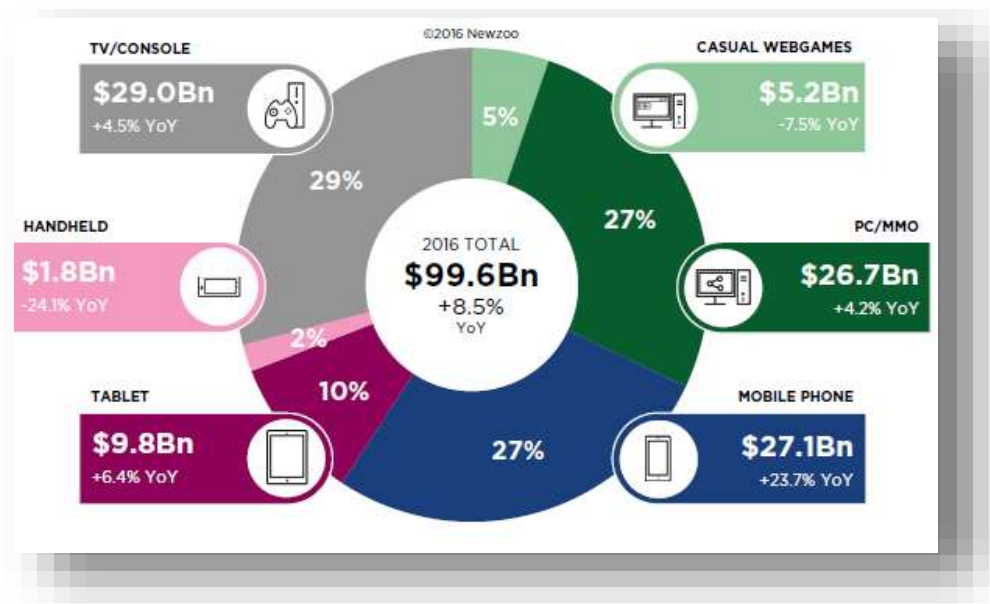


Annex 1 2016 global games market per region



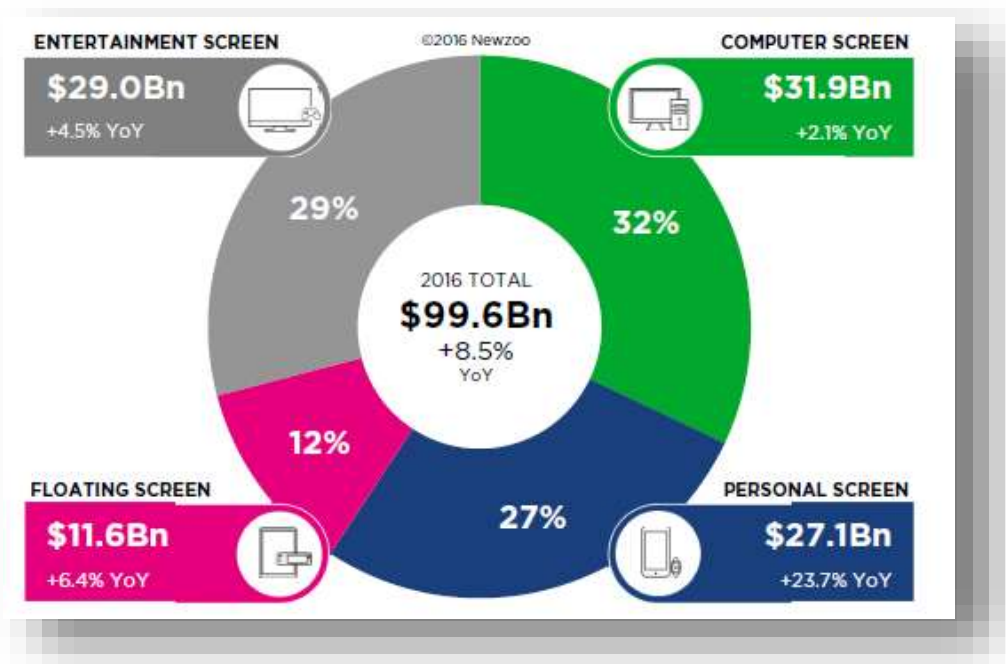
Source 1: Newzoo, *Global Games Market Report Premium*, 2017

Annex 2: 2016 global games market per segment



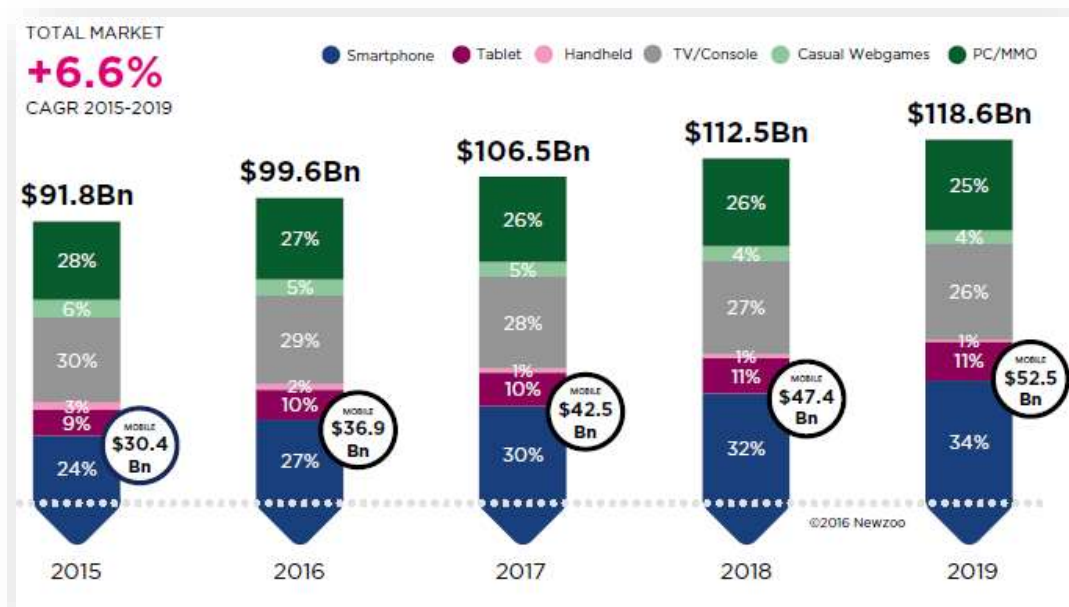
Source 2: Newzoo, *Global Games Market Report Premium*, 2017

Annex 3: 2016 global games market per screen



Source 3: Newzoo, *Global Games Market Report Premium*, 2017

Annex 4: 2016 global games market forecast per segment



Source 4: Newzoo, *Global Games Market Report Premium*, 2017

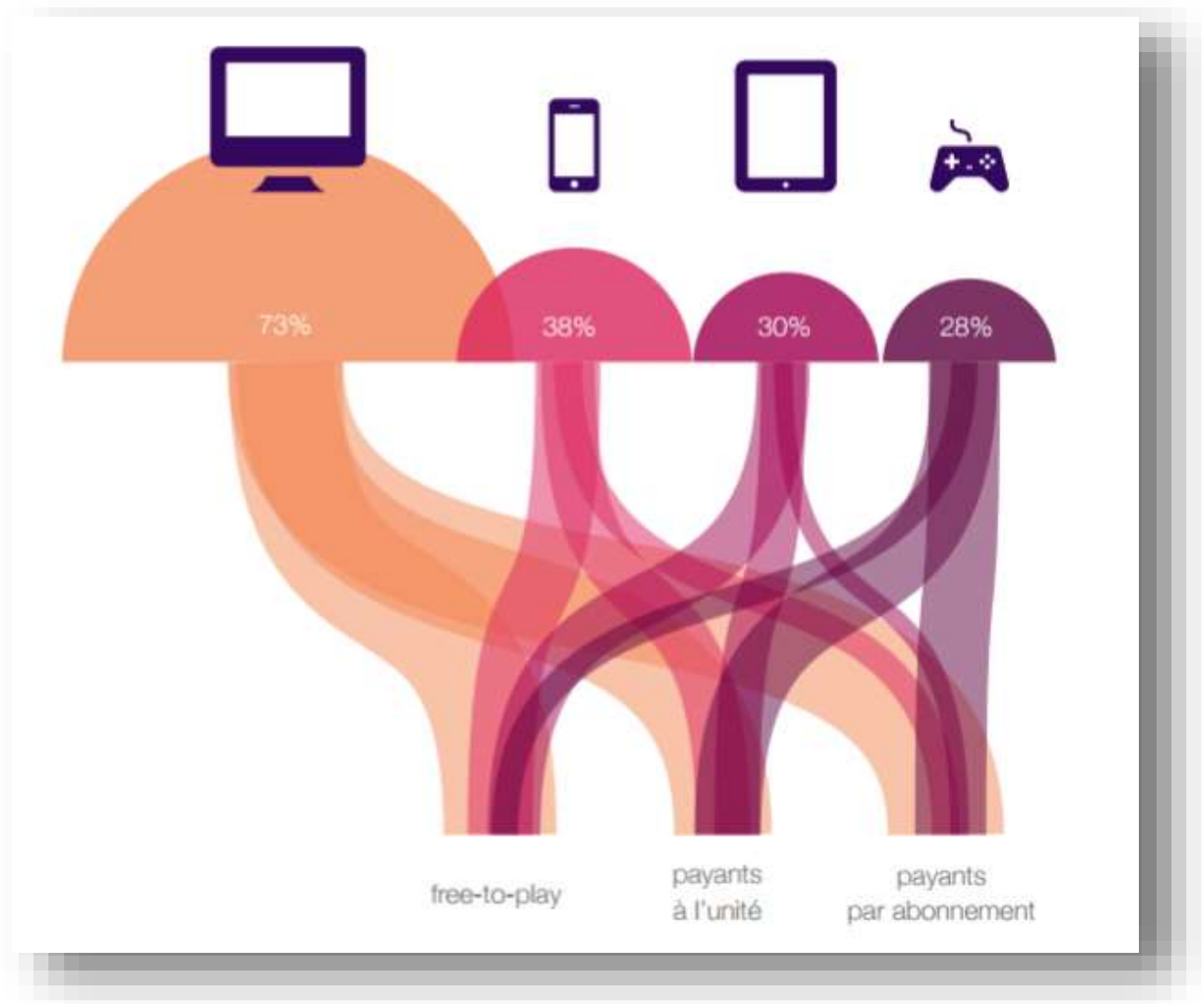


Annex 5: Top 20 by game revenues in 2016

CHANGE	RANK	COUNTRY	POPULATION (M)	ONLINE POPULATION (M)	TOTAL REVENUES (M\$)
▲ 1	1	CHINA	1,382.3	788.8	24,368.8
▼ 1	2	USA	324.1	293.6	23,598.4
-	3	JAPAN	126.3	117.6	12,447.6
-	4	SOUTH KOREA	50.5	44.6	4,047.3
-	5	GERMANY	80.7	72.4	4,018.7
-	6	UNITED KINGDOM	65.1	61.1	3,830.2
-	7	FRANCE	64.7	56.7	2,737.9
-	8	SPAIN	46.1	37.6	1,812.0
-	9	CANADA	36.3	32.8	1,792.2
-	10	ITALY	59.8	41.3	1,742.1
-	11	RUSSIA	143.4	110.1	1,414.4
▲ 1	12	BRAZIL	209.6	136.4	1,274.8
▼ 1	13	AUSTRALIA	24.3	21.5	1,199.7
-	14	MEXICO	128.6	67.0	1,125.8
-	15	TAIWAN	24.0	21.1	987.8
-	16	TURKEY	79.6	46.8	755.5
-	17	INDONESIA	260.6	56.7	704.4
▲ 1	18	MALAYSIA	30.8	22.8	539.5
▼ 1	19	NETHERLANDS	17.0	16.1	521.3
▲ 1	20	THAILAND	68.1	28.7	521.3

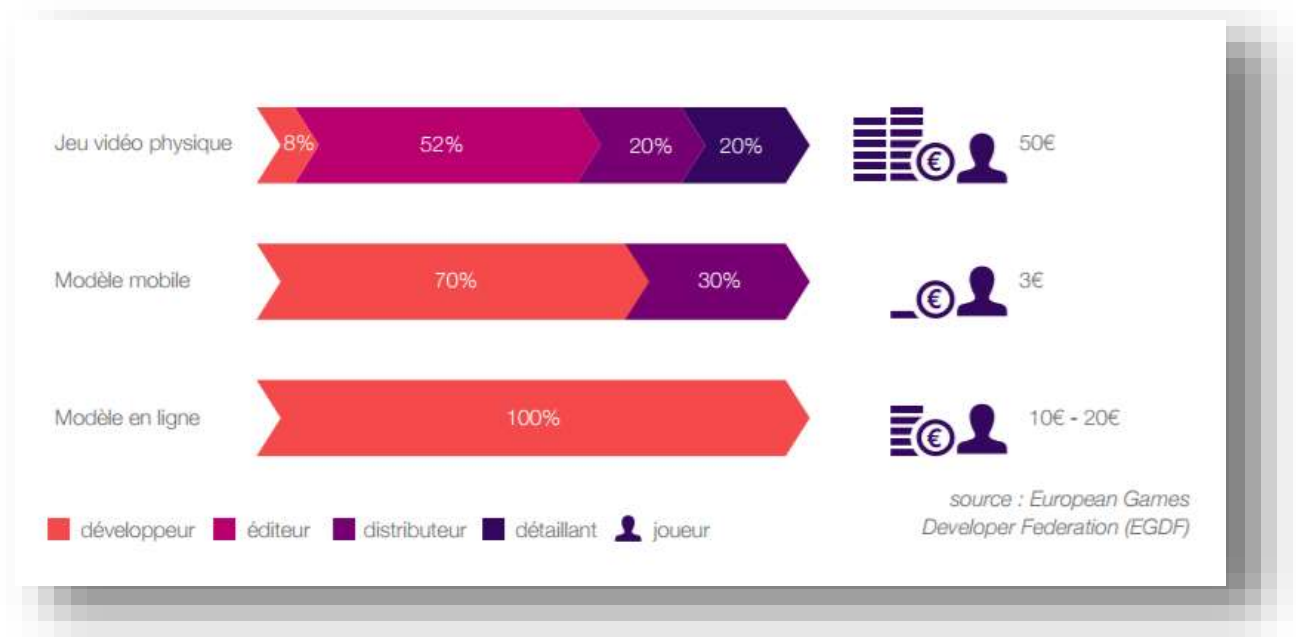
Source 5: Newzoo, *Global Games Market Report Premium*, 2017

Annex 6: Platform repartition according to the type of game



Source 6: IFOP & SNJV, Hadopi, *Le jeu vidéo dématérialisé*, Hadopi- département recherche étude et veille, décembre 2014

## Annex 7: Value Chain



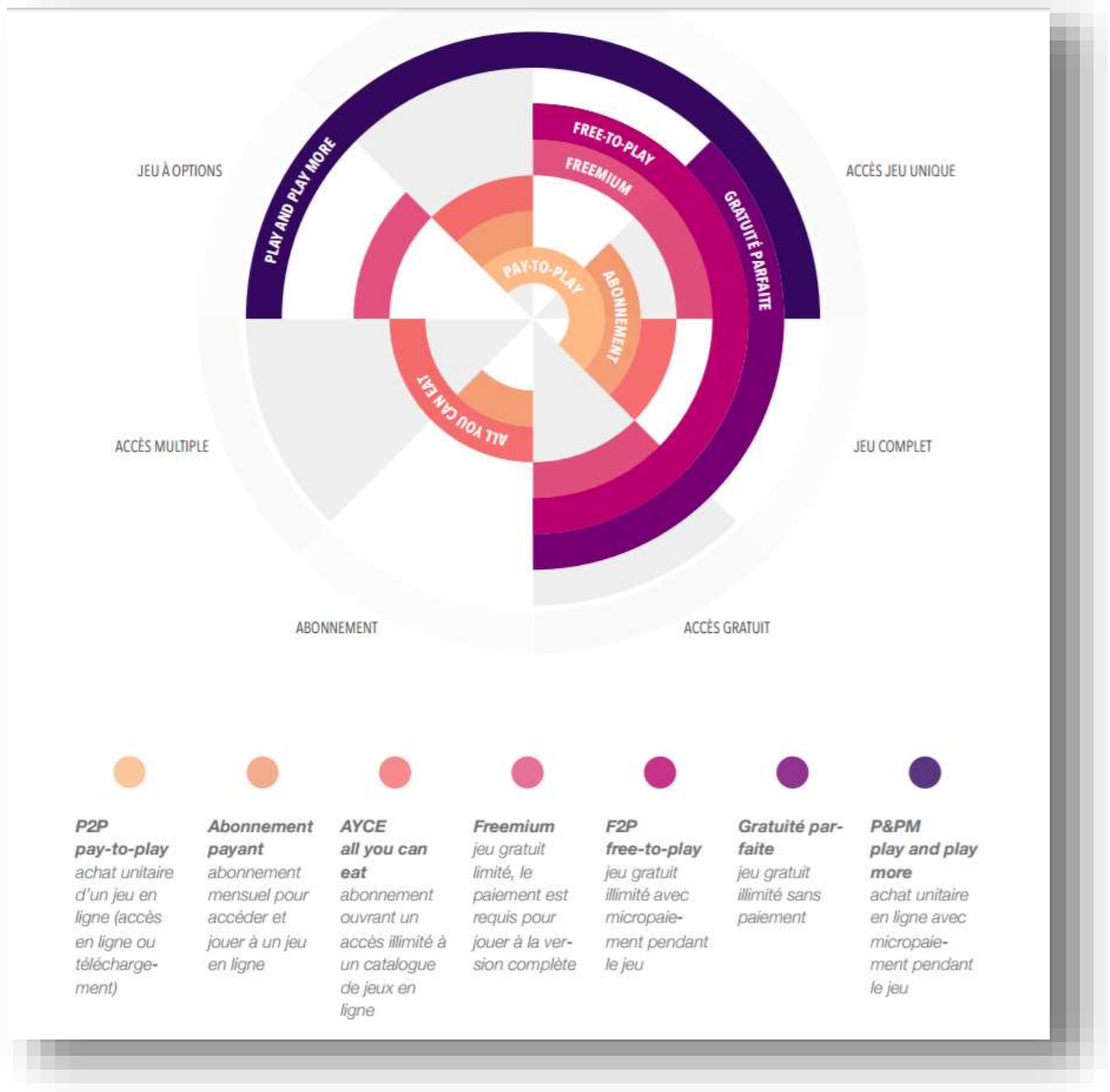
Source 7 : IFOP & SNJV, Hadopi, Le jeu vidéo dématérialisé, Hadopi- département recherche étude et veille, décembre 2014

*With the dematerialization of games, Value chain is simplified: the disintermediation distribution - a single distributor in line ensures the encounter between the game and players, when it needed one or several wholesalers and one retailer in the physical world.*

*The most simple model is disintermediated, in which the developer / editor directly sells the game to players on line It can be summarized under two forms, depending on whether one found in the case of mobile games or online game (not mobile)*



Annex 8: Business model for digital games



Source 8: IFOP & SNJV, Hadopi, Le jeu vidéo dématérialisé, Hadopi- département recherche étude et veille, décembre 2014

## Annex 9: Reason to purchase in game content, description

Reasons to purchase in-game content.

Motivation	Statement	Description	Literature that discusses the phenomenon (in addition to the industry specialist recommendations)
Avoiding spam	I didn't want to bother others by spamming them.	Many free-to-play games have provided the possibility for players to earn in-game currency or goods by sending messages to friends. Spamming friends in this manner, however, is generally frowned upon. Therefore, some players rather pay up than spam their friends.	Alha et al., 2014; Paavilainen, Alha, & Korhonen, 2015b; Paavilainen et al. 2013 (spamming is considered as a major inconvenience in game design); Nieborg, 2015 (paying is an alternative to asking friends to help)
Becoming the best	I wanted to be the best in the game.	Many in-game items boost the performance of players thus giving them an advantage over other players.	Alha et al., 2014 (getting an edge over other players); Lehdonvirta, 2009 (performance & winning); Yee, 2006 (achievement); Ryan et al., 2006 (competence); Tyni et al., 2011 (competition); Nieborg, 2015; Evans, 2015; Park & Lee, 2011 (character competency)
Continuing play	I wanted to continue the game.	Many free-to-play game designs prevent player from continuing the game sessions unless they use real money.	Hamari & Lehdonvirta, 2010 (the need to purchase new items when progressing); Paavilainen et al., 2015a, Paavilainen et al. 2013 (paywalls)
Giving gifts	I wanted to give gifts to others.	Free-to-play games sell gifts that can be given to other players.	Lehdonvirta, 2009; Hamari & Järvinen, 2011; Paavilainen, Alha, & Korhonen, 2016
Investing in a hobby	I wanted to invest in my gaming hobby.	The gaming activity can be considered as a hobby similar to any other free-time activity. Players may be motivated to invest financially to their hobby in addition to investing time.	Alha et al., 2014 (free-to-play games can be compared to other hobbies that cost money)
Indulging the children	I wanted to make my kids happy.	Games are played with young children, or given to older children to be played, both in order to entertain them and to buy free time for the parents. To support those goals, parents may sometimes need to make purchases. The children have their own motivations for gaining the content, but the parents control the money.	Kallio et al., 2010
Personalization	I wanted to personalize my characters, the things I build etc.	One prominent value proposition of a lot of in-game content is that it affords players to differentiate themselves from other players by personalizing their avatar or other belonging in-game.	Lehdonvirta, 2009 (customizability; provenance); Tyni et al., 2011 (customization)
Playing with friends	I wanted to play with my friends.	Some free-to-play games require players to use real money in order to add more friends in-game, or employ highly desired features that must be purchased if one wants to play with their friends.	Hamari & Järvinen, 2011; Yee, 2006 (sociality); Ryan et al., 2006 (relatedness)
Protecting achievements	I wanted to protect stuff I had already earned in the game.	Item/achievement degradation is a prominent game design pattern in free-to-play games where players' earned achievement or items may degrade or be threatened if they are not protected.	Hamari & Lehdonvirta, 2010; Hamari, 2011; Hamari & Järvinen, 2011
Reaching completion	I wanted to complete a level/building etc.	Completing different tasks and levels etc. in a game can be too difficult or time consuming. Therefore, some players might be willing to pay for skipping parts of the game.	Hamari, 2011; Hamari & Järvinen, 2011; Ryan et al., 2006 (competence); Yee, 2006 (achievement); Tyni et al., 2011 (energy refills and task completions)
Reasonable pricing	The free-to-play game was reasonably priced.	Players may be enticed to purchase in-game content if they perceive the deals to be cheap.	Hamari & Järvinen, 2011; Park & Lee, 2011 (monetary value)
Avoiding repetition	I didn't want to spend time repeating same tasks over and over again.	Many games have been criticized for repetitive content. Since designing repetitive content is less costly and requires less innovation it is commonly used. "Grinding" repetitive content can, however, be boring for the players, and therefore, players may be enticed to use real money in order to take a shortcut.	Hamari & Lehdonvirta, 2010 (intentional inconvenient design); Evans, 2015; Paavilainen et al., 2015b
Showing off achievements Showing off to friends	I wanted to show off my achievements in the game. I wanted to show off to my friends.	Players unlock, earn and win many notable signifiers of achievements in games (such as trophies, badges and other virtual goods). However, being able to display all this gaming capital has been also harnessed as a revenue source. Social representativeness and showing off have been observed to be a major reason for in-game content purchases.	Lehdonvirta, 2009 (provenance); Sherry et al., 2006; Tyni et al., 2011; Park & Lee, 2011 (visual authority)



Motivation	Statement	Description	Literature that discusses the phenomenon (in addition to the industry specialist recommendations)
Participating in a special event	I wanted to participate in special events.	Game companies attempt to come up with novel events and content in the game to keep it fresh. This has also been one way for game companies to introduce new purchasable content. Moreover, special events are often perceived as unique one-off events, which may induce perceived rarity and, therefore, fear of missing out.	Hamari & Lehdonvirta, 2010; Lehdonvirta, 2009; Tyni et al., 2011
Special offer	I wanted to buy special offers that give me more value.	Players may be enticed to purchase in-game content if they perceive the deals to be cheap. This may especially be the case if there are special offers of limited quantity or for limited amount of time.	Hamari & Järvinen, 2011; Tyni et al., 2011; Evans, 2015
Speeding timers	I wanted to speed up timers.	Many games set artificial timers as to how long it takes to, for example, build a building into the player's village. Many players wish to make this process quicker.	Hamari & Lehdonvirta, 2010 (intentional inconvenient design); Lehdonvirta, 2009 (speeding gameplay); Tyni et al., 2011 (energy refills and task completions); Nieborg, 2015; Evans, 2015
Supporting a good game	I wanted to support a free-to-play game that is good.	Players might be enticed to spend money on in-game content to support the company running the game and thus ensuring the game's continuance.	Alha et al., 2014
Unlocking content	I wanted to open new playable content (e.g. levels, characters, cards ...).	One major form of in-game content is simply more content to play such as maps and levels.	Hamari & Lehdonvirta, 2010; Nieborg, 2015; Evans, 2015

Source 9: JUHO HAMARI & AL., Why do players buy in-game content. An empirical study on concrete purchase motivation, Elsevier, 2016

#### Annex 10: Purchase motivation results

The purchase motivations EFA (highest loading bolded).

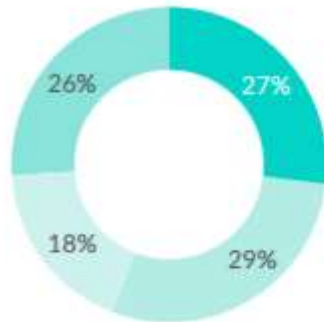
	1 Unobstructed play	2 Social interaction	3 Competition	4 Economical rationale	5 Indulging the children
Speeding timers	<b>0.763</b>	-0.182	0.133	0.141	-0.045
Avoiding repetition	<b>0.716</b>	-0.002	0.202	0.159	-0.045
Reaching completion	<b>0.684</b>	0.136	0.093	-0.058	0.345
Continuing play	<b>0.679</b>	0.265	-0.003	-0.021	0.186
Protecting achievements	<b>0.474</b>	0.347	0.245	-0.009	0.451
Playing with friends	0.181	<b>0.668</b>	0.249	0.108	-0.101
Personalization	-0.129	<b>0.635</b>	0.218	0.235	0.127
Giving gifts	-0.172	<b>0.595</b>	0.194	0.189	0.136
Avoiding spam	0.360	<b>0.567</b>	-0.045	-0.008	-0.009
Participating in a special event	0.184	<b>0.496</b>	0.148	0.186	0.422
Showing off achievements	0.048	0.244	<b>0.818</b>	0.121	0.134
Showing off to friends	0.071	0.202	<b>0.797</b>	0.014	0.117
Becoming the best	0.425	0.002	<b>0.637</b>	0.082	-0.158
Reasonable pricing	0.132	-0.037	-0.018	<b>0.745</b>	-0.157
Supporting a good game	-0.136	0.111	0.065	<b>0.728</b>	0.208
Special offers	0.187	0.295	0.000	<b>0.640</b>	0.063
Investing in a hobby	0.106	0.264	0.216	<b>0.575</b>	0.104
Indulging the children	0.062	-0.022	0.021	0.088	<b>0.796</b>
Unlocking content	0.395	0.368	-0.177	0.177	-0.151
% of variance	15.4%	12.7%	11.0%	10.9%	7.3%
Eigenvalue	4.770	2.172	1.578	1.308	1.056

Source 10: JUHO HAMARI & AL., Why do players buy in-game content. An empirical study on concrete purchase motivation, Elsevier, 2016



Annex 11: Gamer demographics

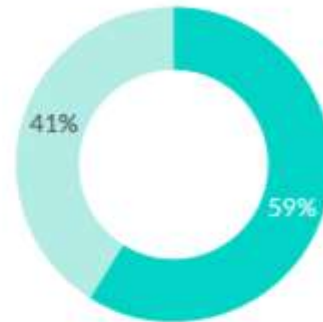
The average game player age is **35** years old



**AGE**

of Game Players

- 27% under 18 years
- 29% 18-35 years
- 18% 36-49 years
- 26% 50+ years



**GENDER**

of Game Players

- 59% male
- 41% female

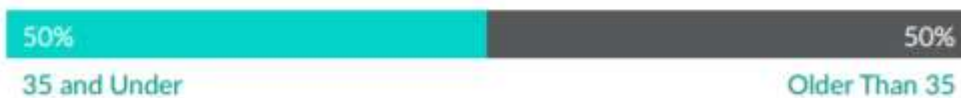


The most frequent **FEMALE GAME PLAYER** is on average **44 years old** and the average **MALE GAME PLAYER** is **35 years old**



Women age 18 or older represent a significantly greater portion of the game-playing population (31%) than boys age 18 or younger (17%)

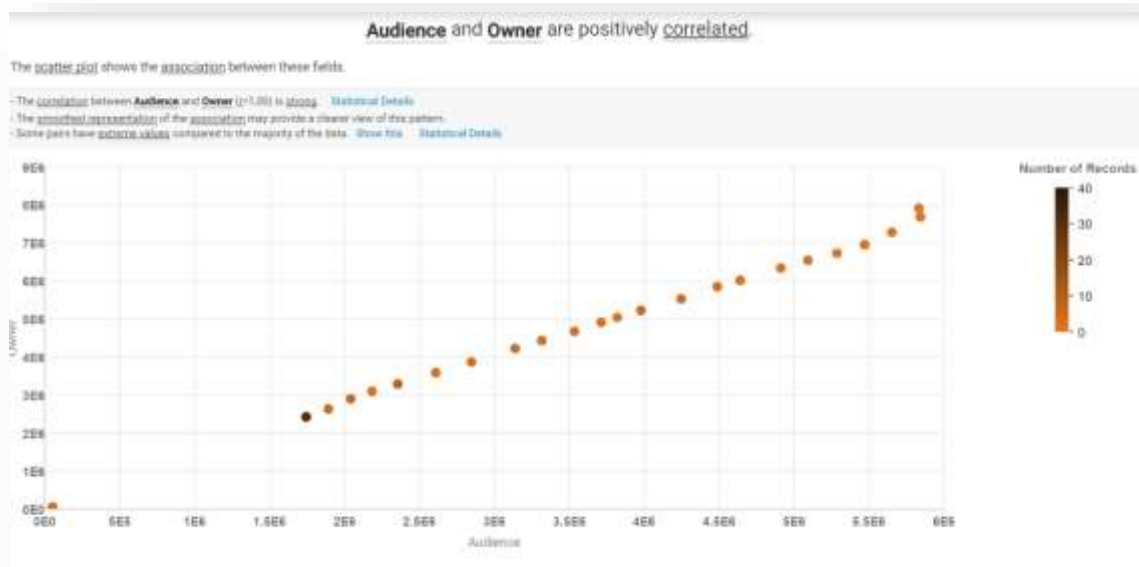
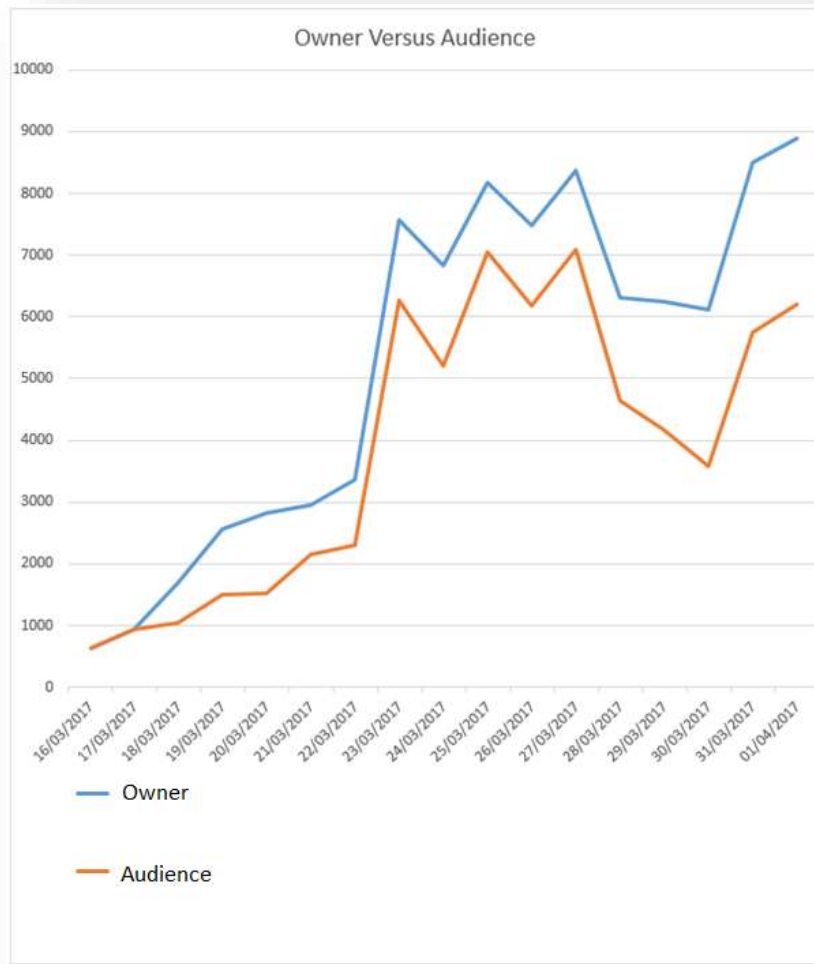
**THERE IS AN EQUAL DISTRIBUTION OF FEMALE VIDEO GAMERS IN AGE:**



The average number of years gamers have been playing video games: **13**

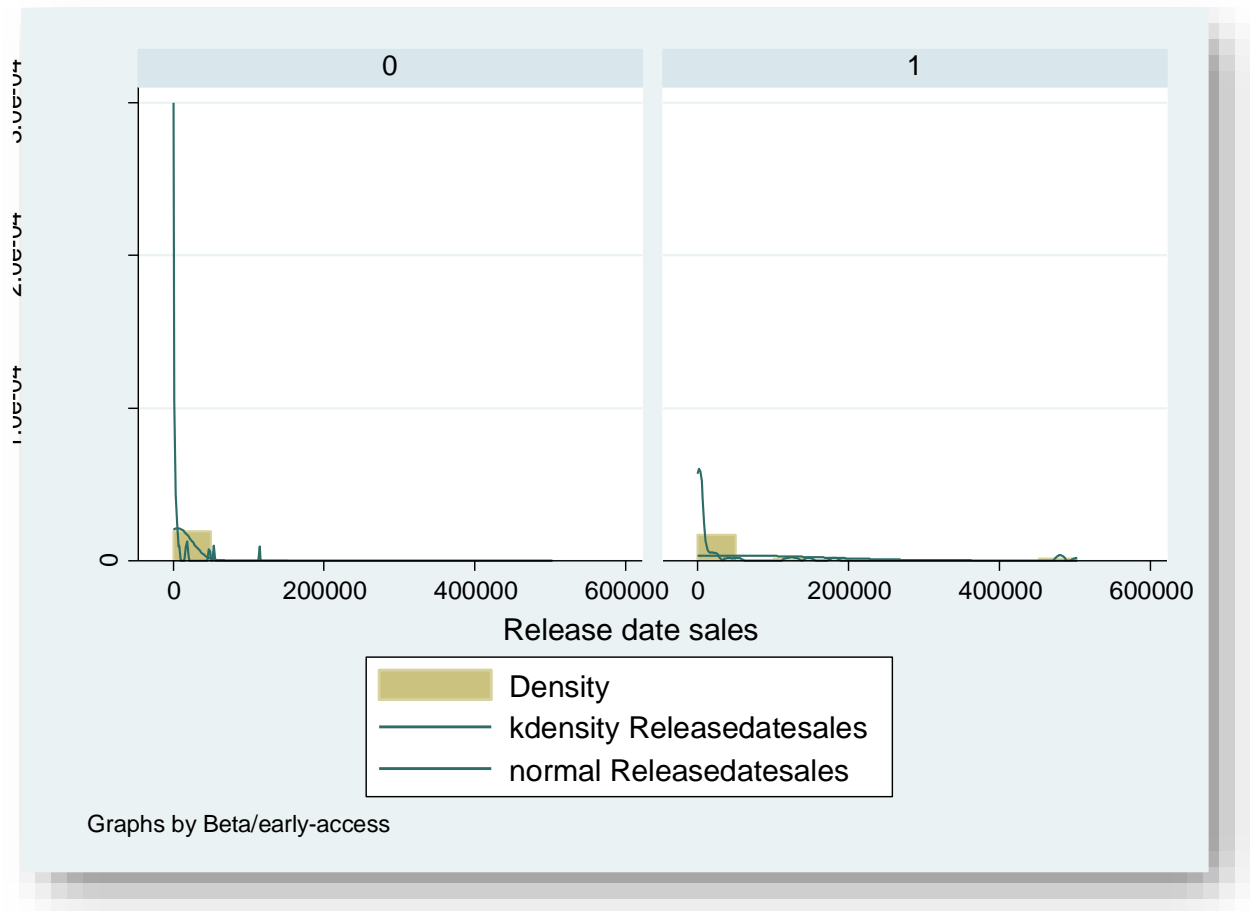


Annex 12: Correlation of Owner and Audience





Annex 13: Beta & Early-access impact





Annex 14: Stata linear regression results

Variable	Obs	Mean	Std. Dev.	Min	Max
A	100	50.5	29.01149	1	100
Game	0				
Releasedate	100	20881.86	19.04594	20842	20909
Betaearlya~s	100	.5	.5025189	0	1
E	0				
Releasedat~s	100	25969.78	87475.29	0	502901

Contains data

obs: 101  
vars: 6  
size: 10,201

variable name	storage type	display format	value label	variable label
A	byte	%10.0g		#
Game	str80	%80s		Game
Releasedate	int	%td..		Release date
Betaearlyaccess	byte	%10.0g		Beta/early-access
E	str13	%13s		
Releasedatesa~s	long	%10.0g		Release date sales

. by Betaearlyaccess, sort : swilk Releasedatesales

-> Betaearlyaccess = 0

Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z	Prob>z
Releasedat~s	50	0.39031	28.673	7.157	0.00000

-> Betaearlyaccess = 1

Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z	Prob>z
Releasedat~s	50	0.41986	27.283	7.051	0.00000

-> Betaearlyaccess = .

Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z	Prob>z
Releasedat~s	0	.	.	.	.



. histogram Releasedatesales, normal kdensity by(Betaearlyaccess)

. kwallis Releasedatesales, by(Betaearlyaccess)

Kruskal-Wallis equality-of-populations rank test

Betaea~s	Obs	Rank Sum
0	50	2007.00
1	50	3043.00

chi-squared = 12.752 with 1 d.f.  
probability = 0.0004

chi-squared with ties = 13.143 with 1 d.f.  
probability = 0.0003

. ranksum Releasedatesales, by(Betaearlyaccess)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

Betaearly~s	obs	rank sum	expected
0	50	2007	2525
1	50	3043	2525
combined	100	5050	5050

unadjusted variance 21041.67  
adjustment for ties -626.52  
adjusted variance 20415.15

Ho: Releas~s(Betaea~s==0) = Releas~s(Betaea~s==1)  
z = -3.625  
Prob > |z| = 0.0003

Annex 15: Stata linear regression mixed model results

Same model with Audience Removed

```
. mixed LogOwner Tviews YVideoa Yviewsa Positive Negative Beta Released
c.Tviews#Released c.YVideoa#Released c.Yviewsa#Released c.Positive#Released
c.Negative#Released || Game:
```

Performing EM optimization:

Performing gradient-based optimization:

```
Iteration 0: log likelihood = -21320.2
Iteration 1: log likelihood = -21320.2 (backed up)
```

Computing standard errors:

```
Mixed-effects ML regression          Number of obs    =    9000
Group variable: Game                 Number of groups =     100

Obs per group: min =      92
                  avg =     93.0
                  max =      93
```



```
Log likelihood = -21320.2          Wald chi2(12)    = 12771.92
                                   Prob > chi2       =  0.0000
```

LogOwner	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
Tviews	8.59e-06	.0000134	0.64	0.520	-.0000176	.0000348
YVideoa	-.0004047	.0004138	-0.98	0.328	-.0012158	.0004064
Yviewsa	1.76e-08	3.62e-08	0.49	0.627	-5.34e-08	8.87e-08
Positive	.0012561	.0016521	0.76	0.447	-.001982	.0044941
Negative	-.0082475	.005393	-1.53	0.126	-.0188176	.0023227
Beta	2.668929	.5946536	4.49	0.000	1.503429	3.834428
Released	6.593554	.0625706	105.38	0.000	6.470918	6.71619
Released#c.Tviews						
1	4.21e-06	.0000216	0.19	0.846	-.0000381	.0000465
Released#c.YVideoa						
1	.0026231	.0032274	0.81	0.416	-.0037024	.0089487
Released#c.Yviewsa						
1	-1.44e-07	8.00e-08	-1.79	0.073	-3.00e-07	1.32e-08
Released#c.Positive						
1	-.0019591	.0024697	-0.79	0.428	-.0067996	.0028813
Released#c.Negative						
1	-.0001959	.0071193	-0.03	0.978	-.0141495	.0137577
_cons	1.775102	.4123877	4.30	0.000	.9668372	2.583367



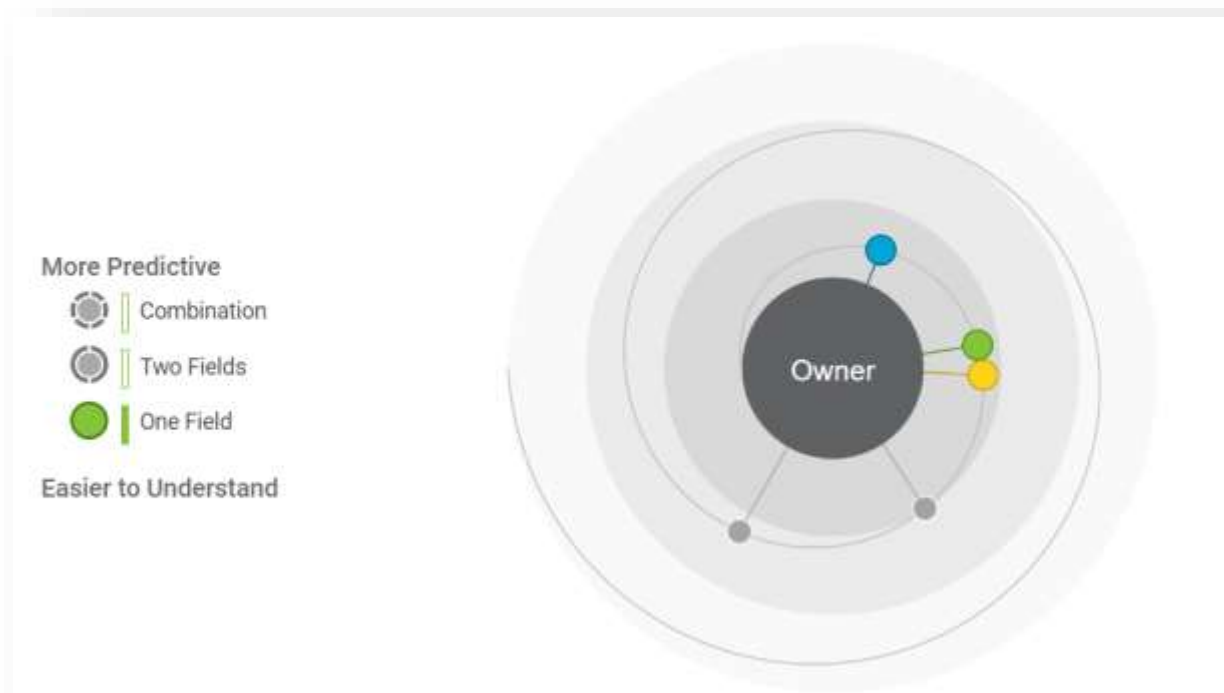
Random-effects Parameters	Estimate	Std. Err.	[95% Conf. Interval]	
Game: Identity				
var(_cons)	8.767031	1.24815	6.632362	11.58876
var(Residual)	5.450104	.0803792	5.294818	5.609943

Annex 16: Data quality and associations

<p><b>TARGETS</b> This workbook has <b>1 target</b></p> <p><a href="#">Edit</a></p>		<p><b>EXCELLENT DATA QUALITY</b></p> <p>There are 8 issues with your data, click below to learn more.</p> <p><a href="#">View</a></p>	
---	---	---	---

<p><b>ANALYSIS DETAILS</b> 7/9 inputs were potentially useful.</p>		<p><b>TOP FIELD ASSOCIATIONS</b> 12 strong associations were found between fields.</p> <p><a href="#">View</a></p>	
--	---	--	---

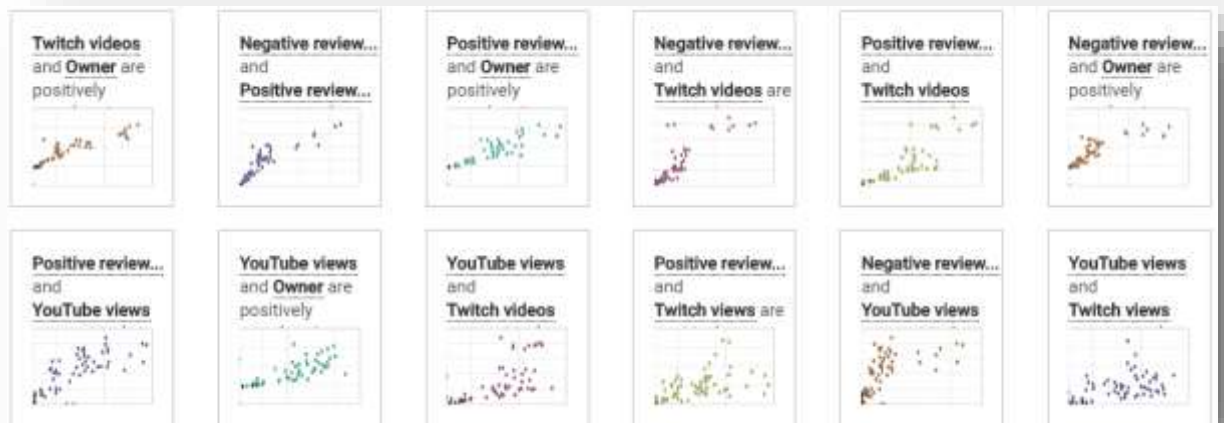
Annex 17: Prediction model, One Field



Annex 18: Prediction model, Combination

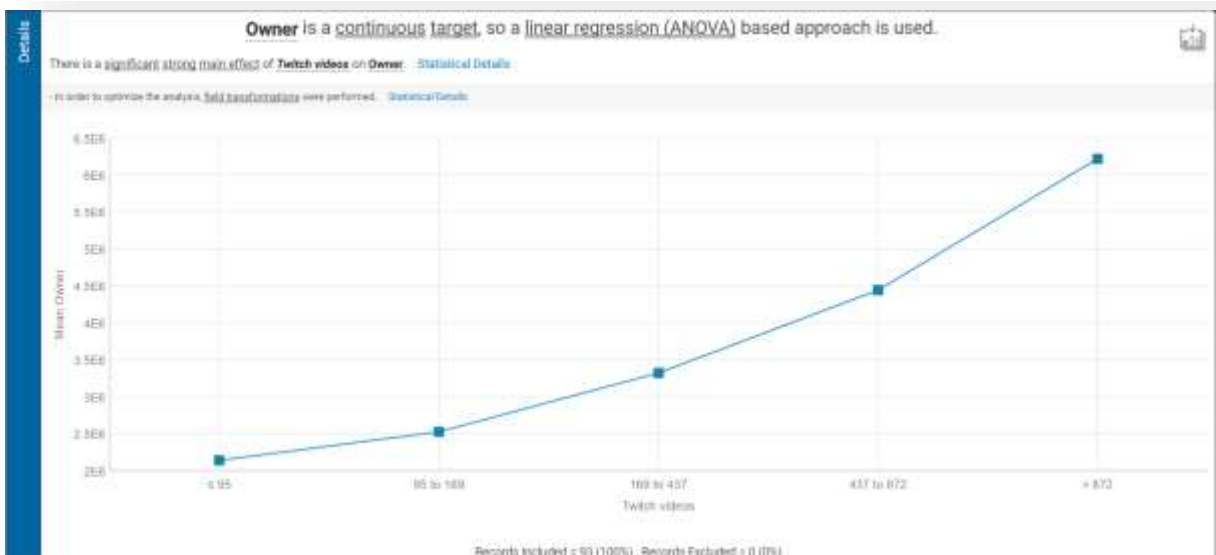
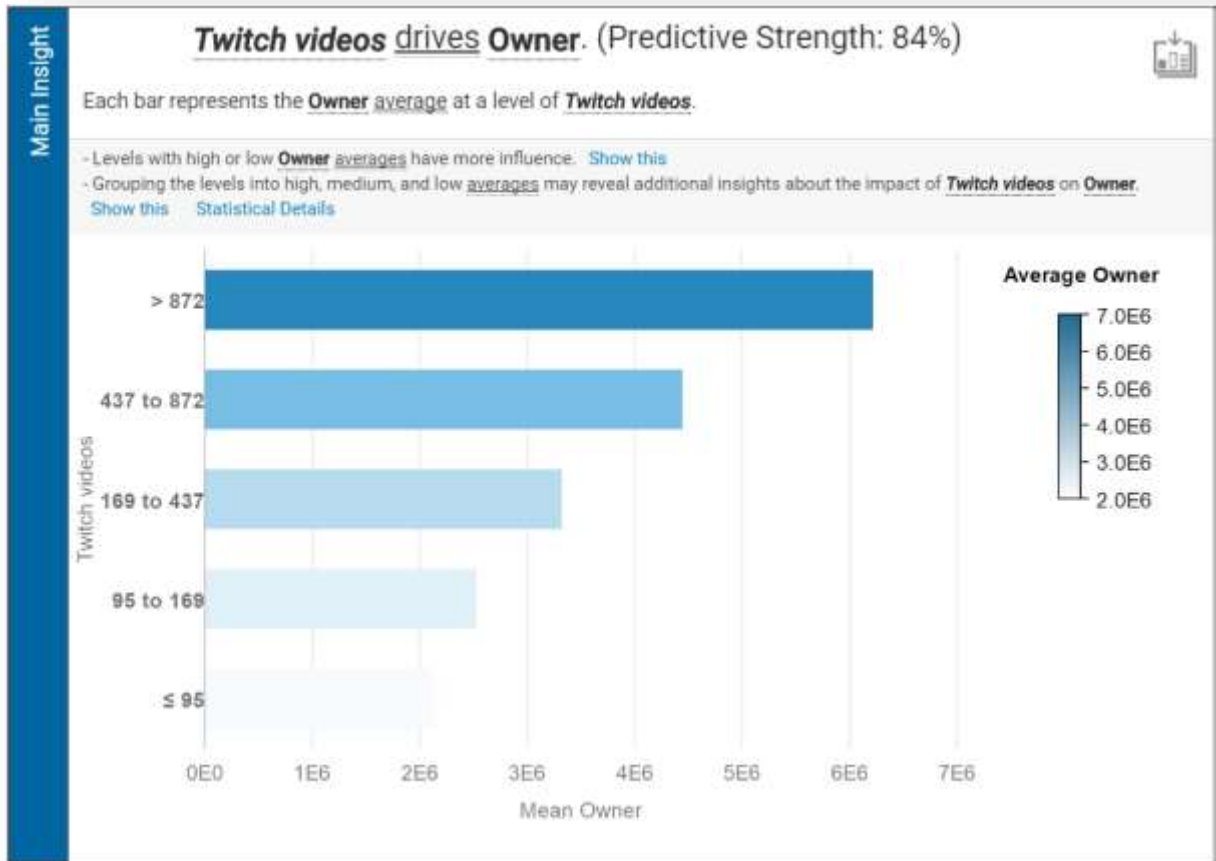


Annex 19: Positive Correlations, Top Field Association

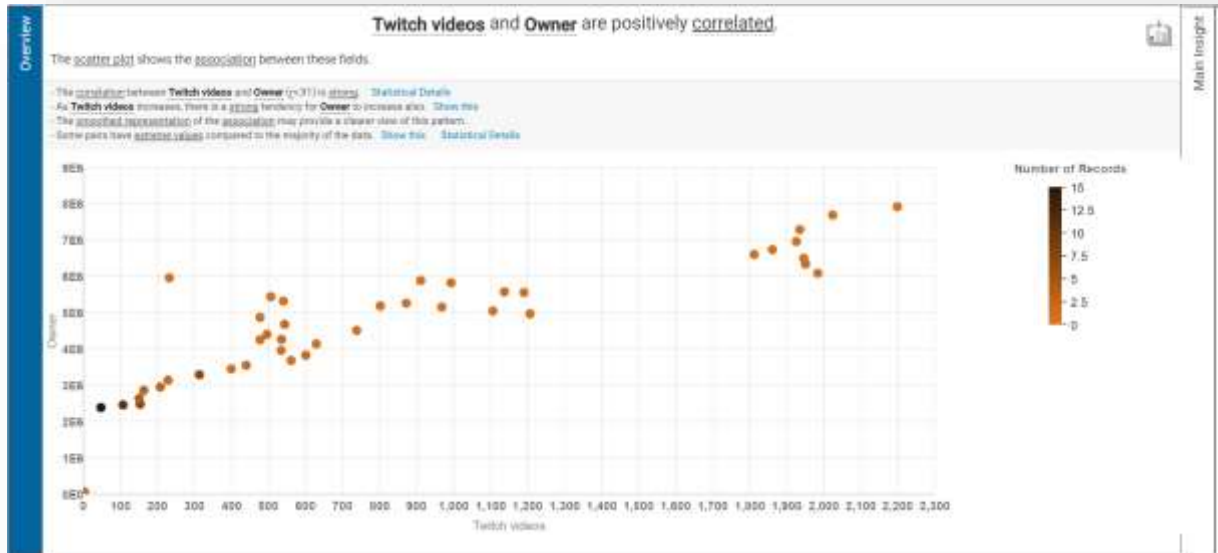




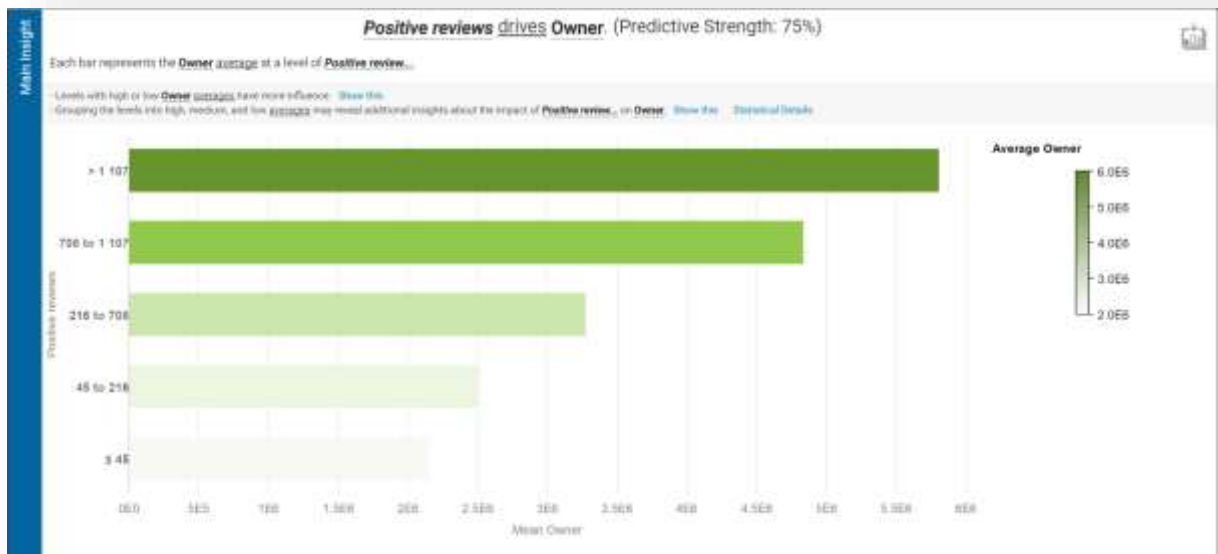
Annex 20: Twitch videos

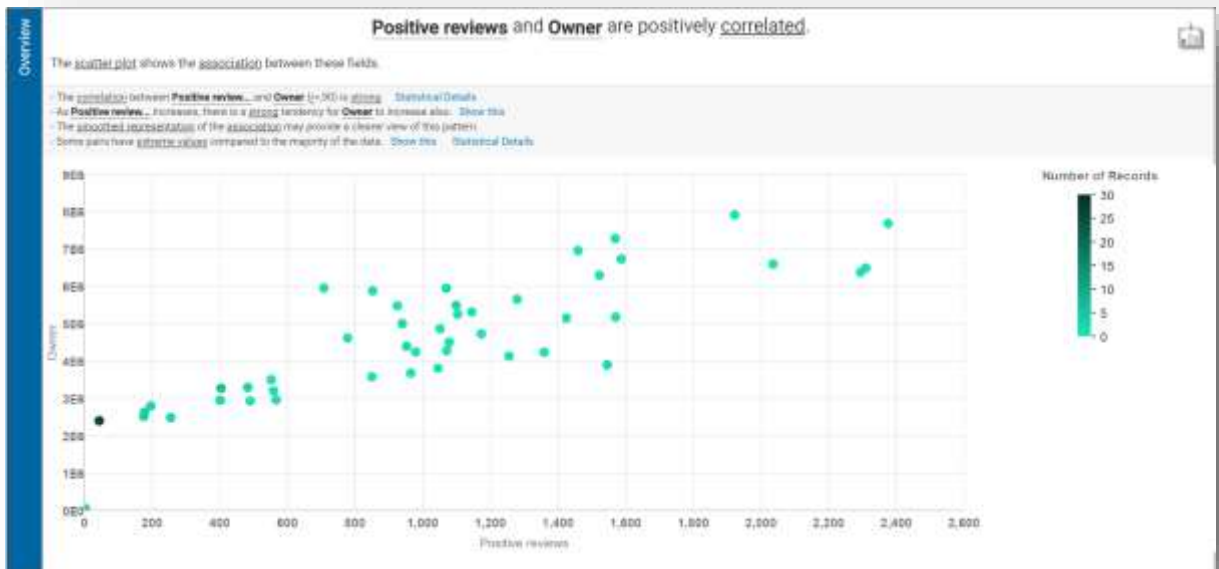
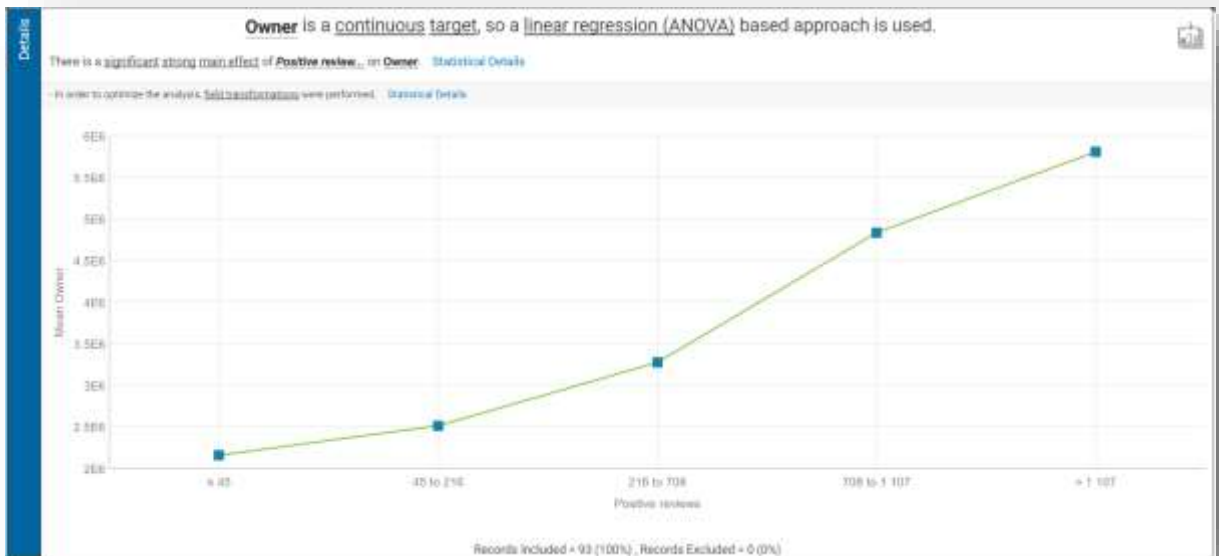






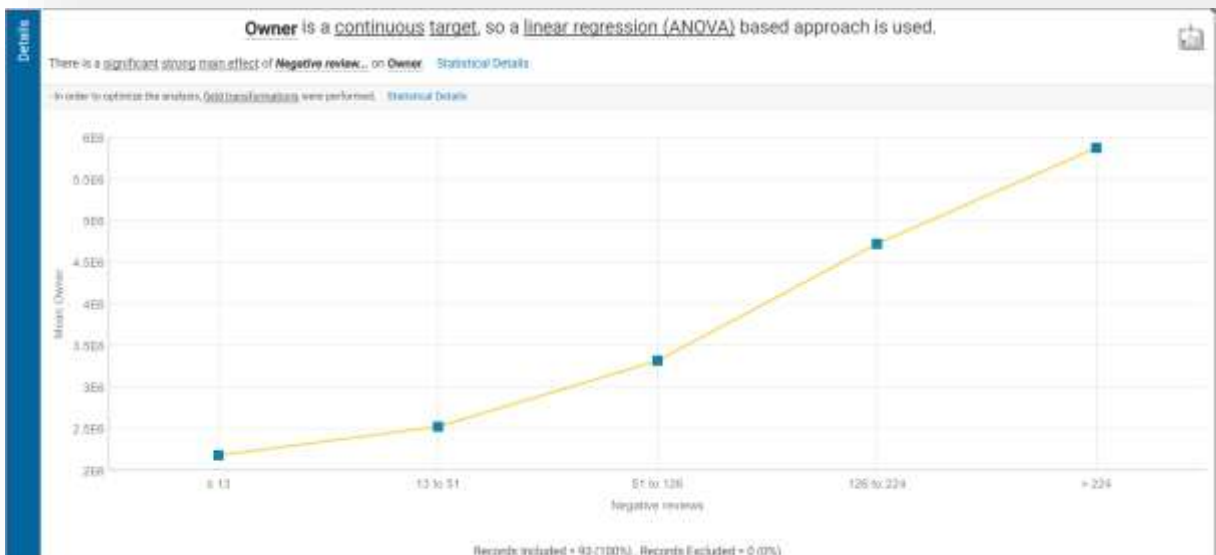
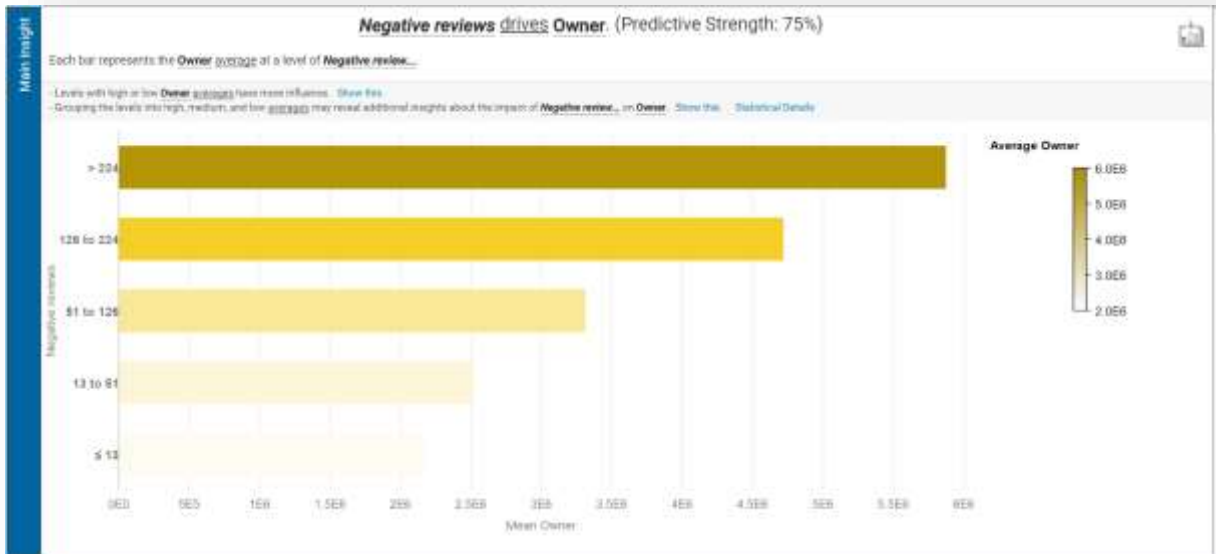
## Annex 21: Positive reviews

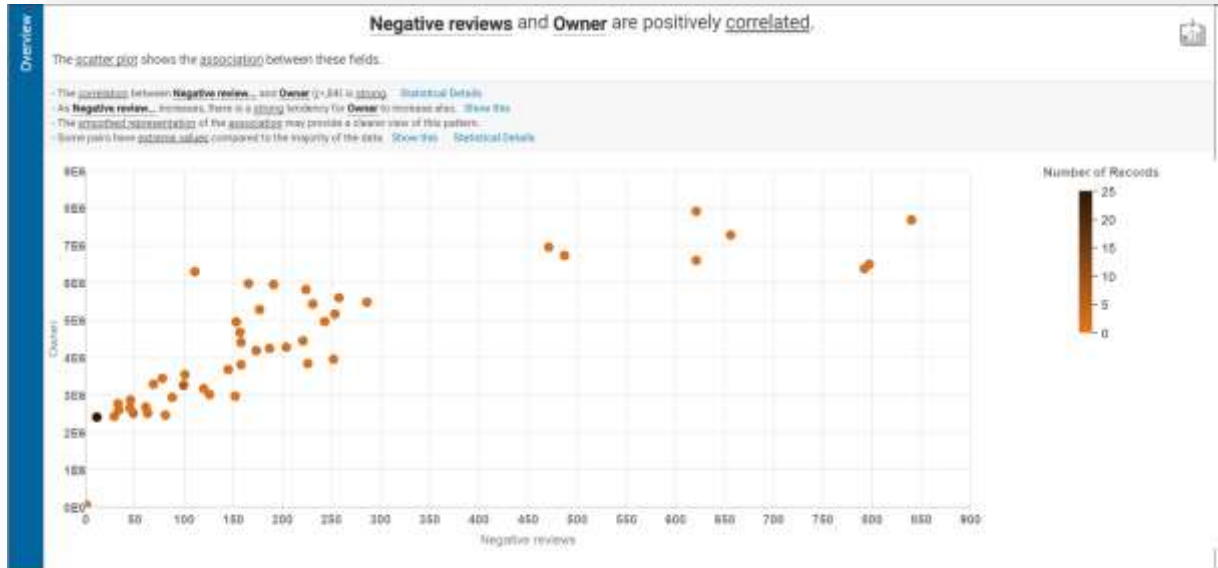




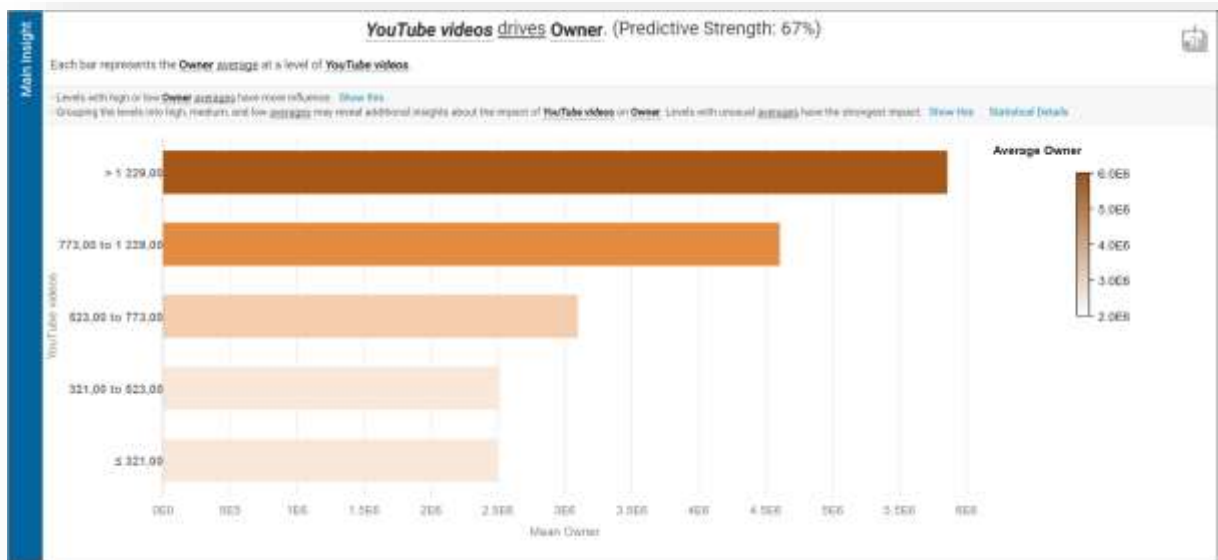


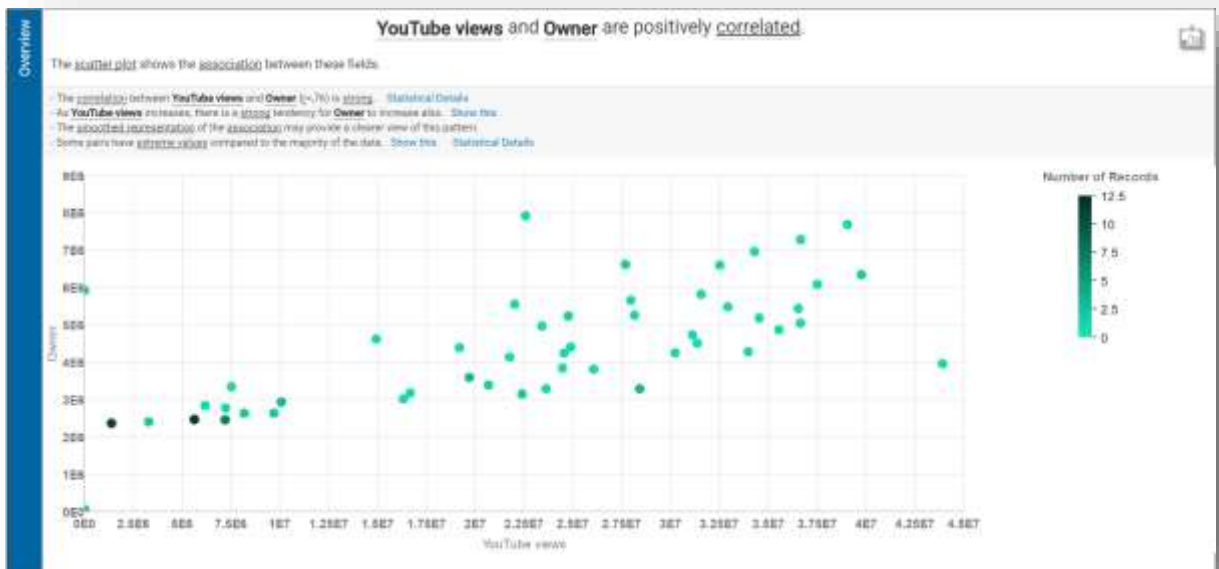
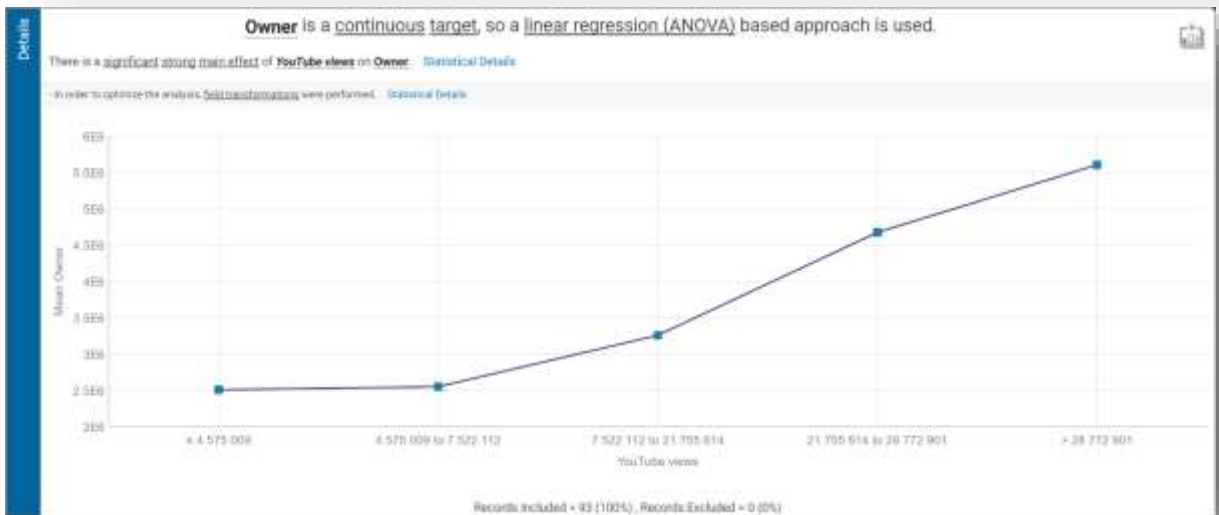
Annex 22: Negative reviews





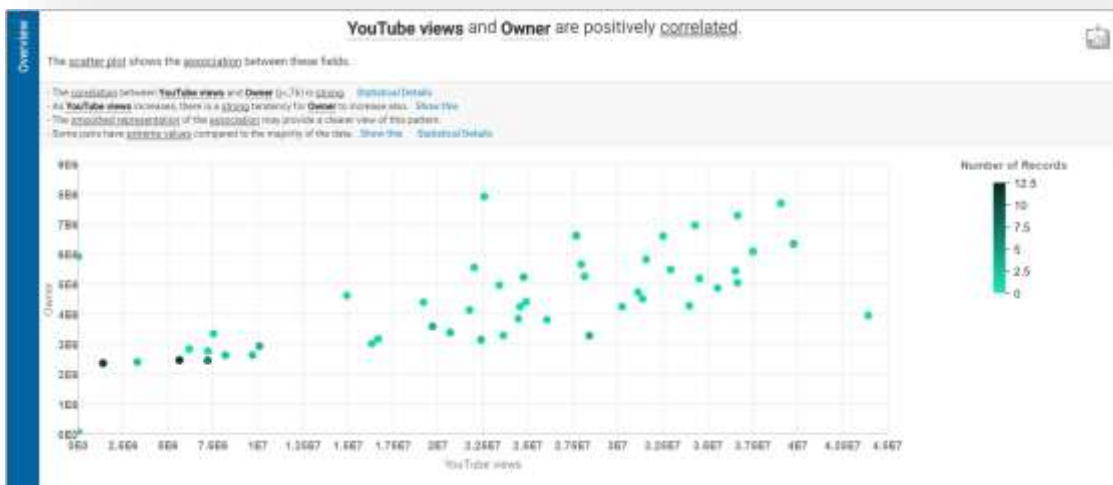
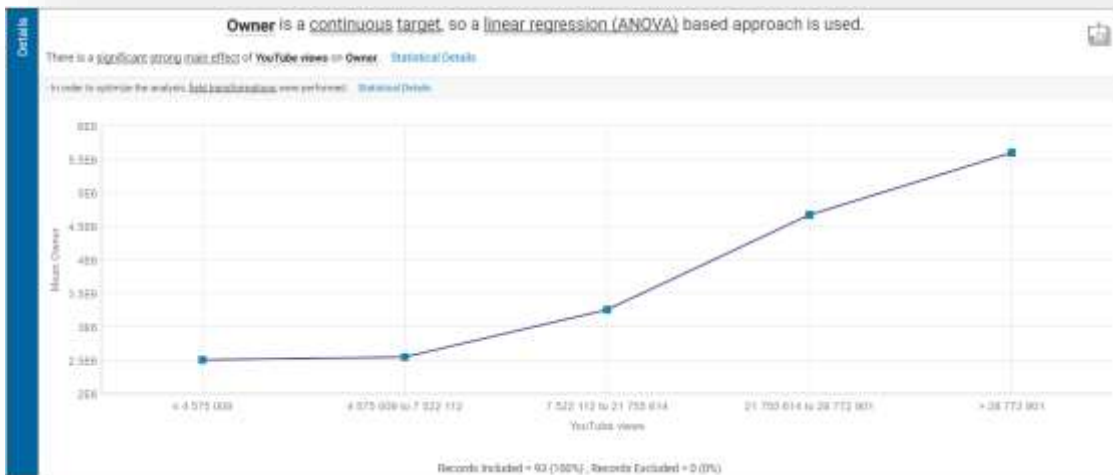
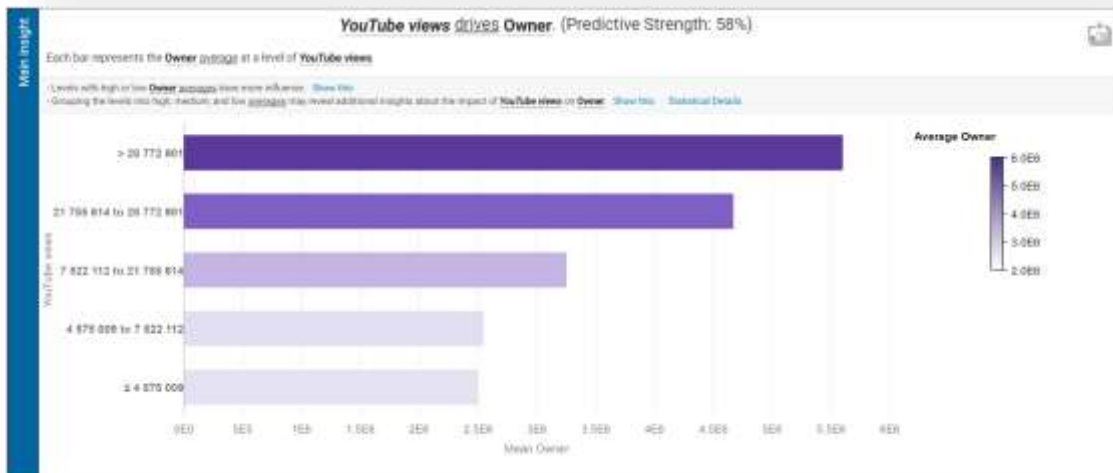
### Annex 23: YouTube videos





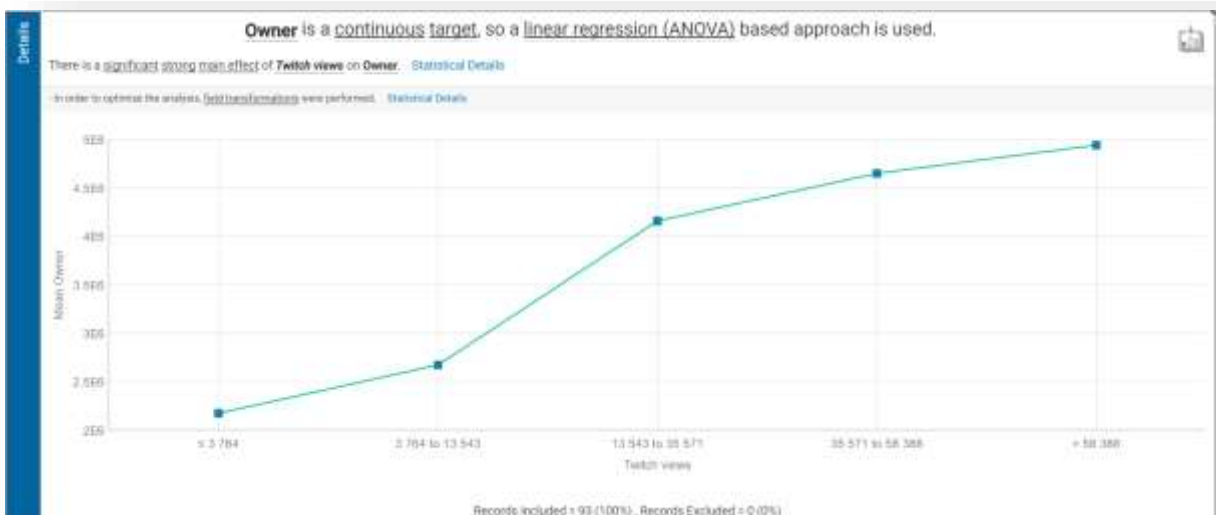
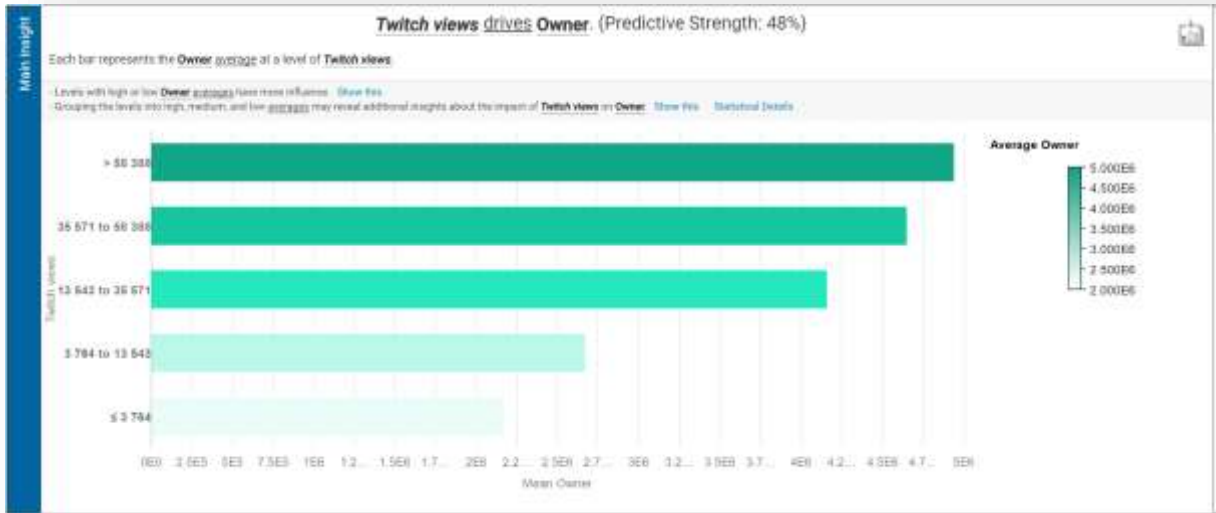


Annex 24: YouTube views



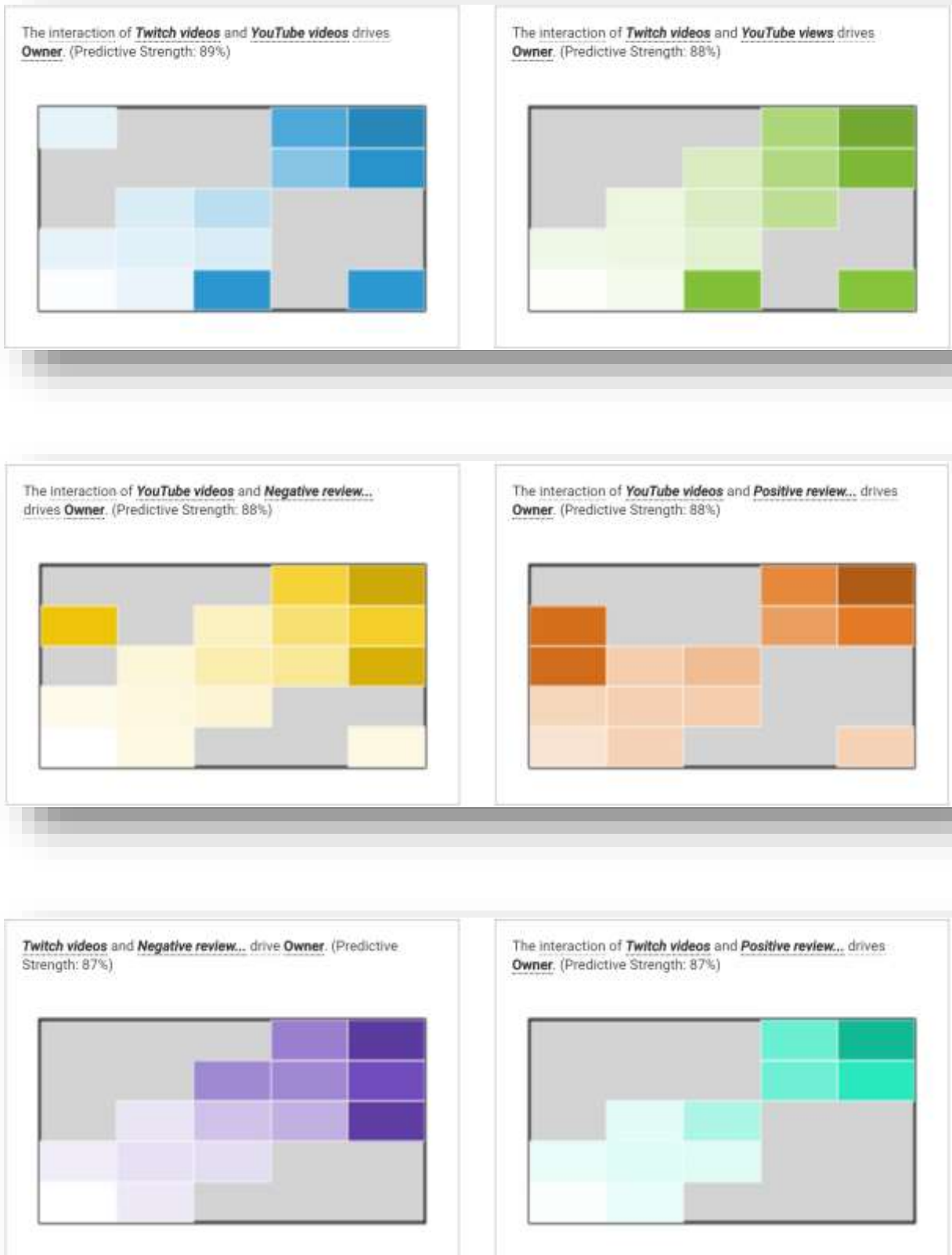


Annex 25: Twitch views





Annex 26: Drivers in the prediction model with interaction

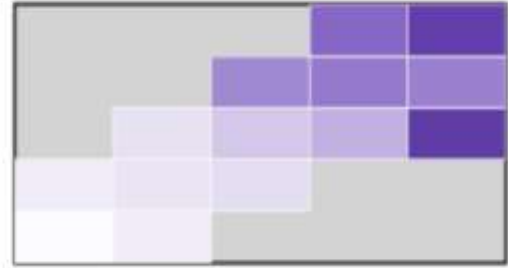




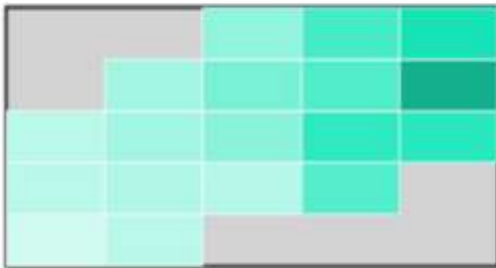
The interaction of Positive review... and YouTube views drives Owner. (Predictive Strength: 83%)



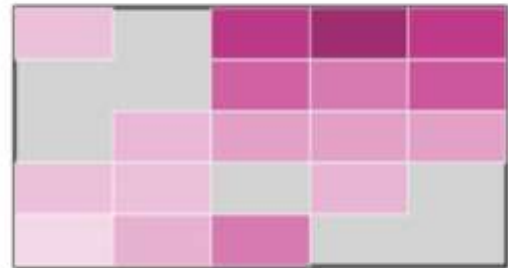
The interaction of Positive review... and Negative review... drives Owner. (Predictive Strength: 81%)



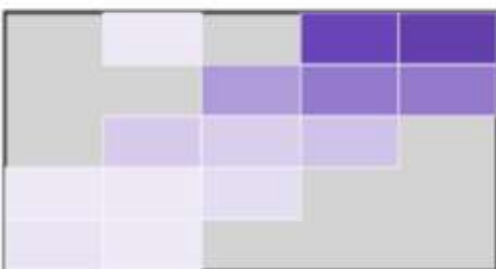
Negative review... and Twitch views drive Owner. (Predictive Strength: 80%)



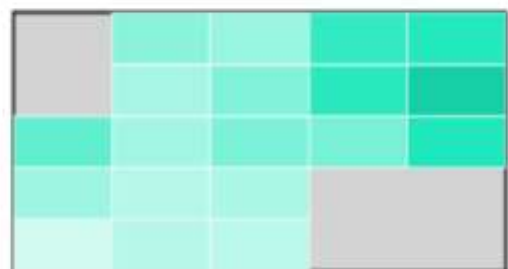
The interaction of Twitch views and YouTube videos drives Owner. (Predictive Strength: 79%)



YouTube views and YouTube videos drive Owner. (Predictive Strength: 73%)

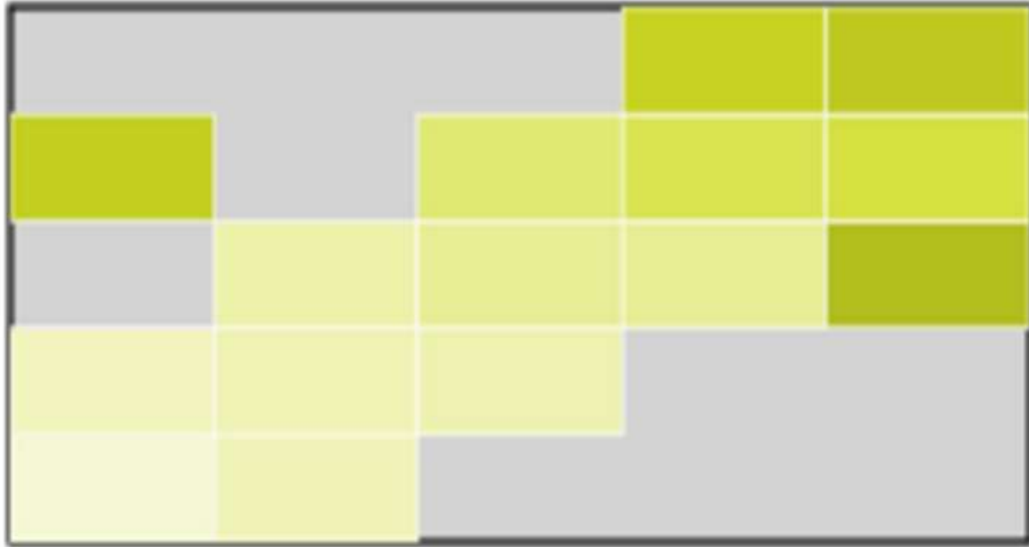


YouTube views and Twitch views drive Owner. (Predictive Strength: 68%)



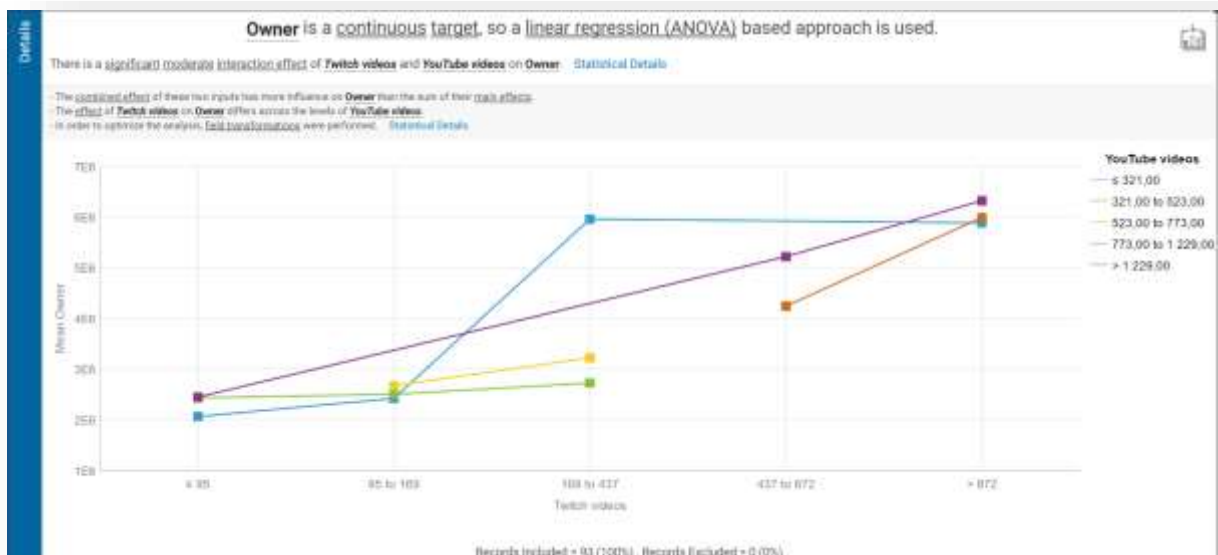
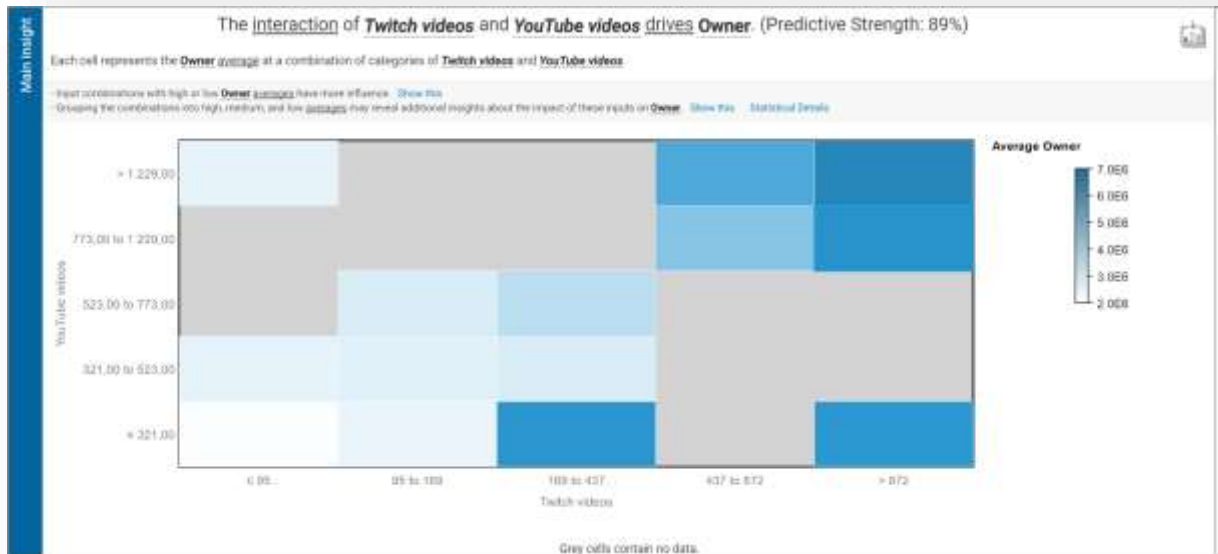


The interaction of **YouTube views** and **Negative review...** drives **Owner**. (Predictive Strength: 83%)





Annex 27: Interaction of Twitch videos and YouTube videos



Annex 28: Interaction of Positive reviews and Negative reviews

