ΔΙΑΤΜΗΜΑΤΙΚΟ ΠΡΟΓΡΑΜΜΑ ΜΕΤΑΠΤΥΧΙΑΚΩΝ ΣΠΟΥΔΩΝ ΣΤΑ ΠΛΗΡΟΦΟΡΙΑΚΑ ΣΥΣΤΗΜΑΤΑ

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“Business models and Pricing Strategies in videogames industry”

του

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Υποβλήθηκε ως απαιτούμενο για την απόκτηση του μεταπτυχιακού διπλώματος ειδίκευσης στα Πληροφοριακά Συστήματα

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Abstract

In our thesis we examine which factors have an influence on players' intention to buy virtual items. In order to examine these factors we created a research model and conducted an online survey. Especially, we included constructs from an IS (Information System) perspective as well as from a game centric approach. We analyzed the results using PLS-SEM method and we found out that the Game-centric constructs: customization options, in-game functionality features, prestige, participation and perceived enjoyment have a positive effect. We distinguished as the most important Game-centric constructs the customization options, the in-game functionality features and the prestige. IS-centric constructs such as performance expectancy, effort expectancy and perceived value are also important for players' intention to buy virtual items and they have a strong effect. These results can be useful to videogame companies which adopt business models that include virtual item transactions. Based on these results we suggest that videogame companies should offer virtual items taking into account the most important Game-centric constructs and establish or improve their virtual shops by taking into account the IS-centric constructs.

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Introduction

Current state of video games industry

Video games are a new and fairly niche market, that has been developed quickly and become a very important part of the digital entertainment media industry. In particular, when it comes to growth rates, the field of video games is expected to continue to grow at a pace of four times compared to the overall growth rate of the digital entertainment market (De Prato, Feijóo, Nepelski, Bogdanowic, & Simon, 2010).

To make it easier to understand the extent and the impact of the particular industry, we note that the domain of video games surpassed in size the film industry in the U.S. in 2001 and in UK in 2009 (De Prato at al., 2010). Currently, the world of video games turnovers an amount of $ 70.4 billion and by 2016 is expected to overpass $ 86.1 billion (Warman, 2013). Revenues from gaming products and services in a country like the United States have a direct effect on its gross domestic product (GDP) (Crandall & Sidak, 2006).

The current pillars of video games growth are the console industry with pc gaming industry to follow up (Figure 1). However, it is important to distinguish the rising mobile gaming growth rate and the downfall of the handhelds and social/casual gaming. Specially, in Figure 2 we can notice the Compound Annual Growth Rate (CAGR) of each platform. Tablets have the highest CAGR at 47,6%,while smartphones have a CAGR of 18,8%. On the other hand, handhelds and social gaming have a negative outlook, as they are expected to shrink at rate of 15% and 1,7%, respectively. While, PC and Consoles are expected to have relatively steady CAGRs at 4% and 3,5%. Overall, global video games market is expected to have a CAGR of 6,7% until 2016 (Warman, 2013).

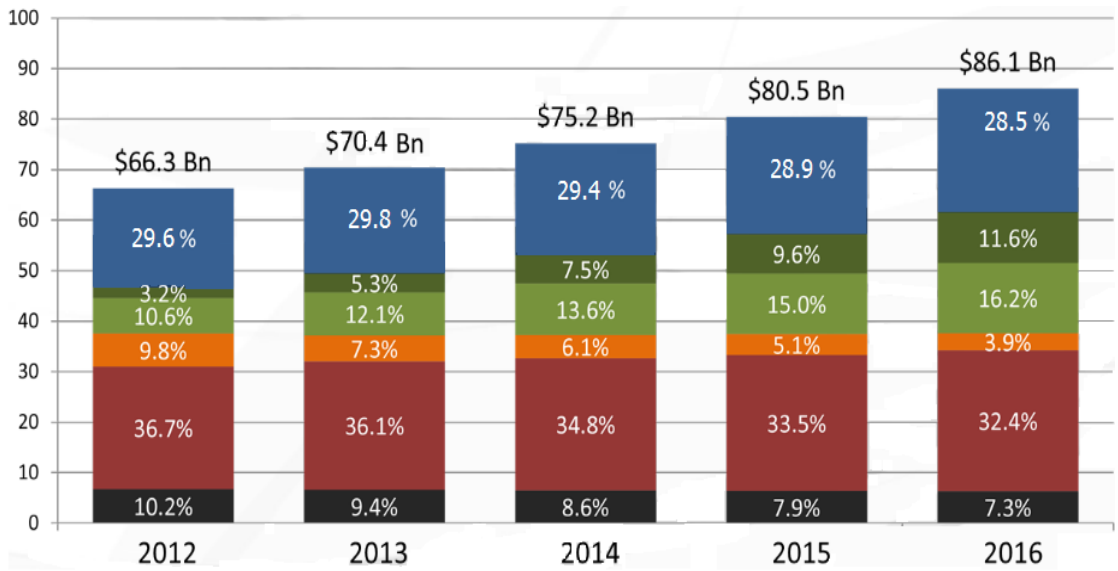

Figure 1 Global Market 2012 – 2016 ("Global Monetization of Games Emerging Markets as Drivers of Growth, 2013")

Table 1-Global Market 2012 - 2016

	Annual Growth Rates				
Year	2012	2013	2014	2015	2016
PC	29,6%	29,8%	29,4%	28,9%	28,5%
Tablet	3,2%	5,3%	7,5%	9,6%	11,6%
Smartphone	10,6%	12,1%	13,6%	15,0%	16,2%
Handhelds	9,8%	7,3%	6,1%	5,1%	3,9%
TV/Consoles	36,7%	36,1%	34,8%	33,5%	32,4%
Social/Casual	10,2%	9,4%	8,6%	7,9%	7,3%
Total market revenue	$ 66.3 bln	$ 70.4 bln	$ 70.5 bln	$ 80.5 bln	$ 86.1 bln

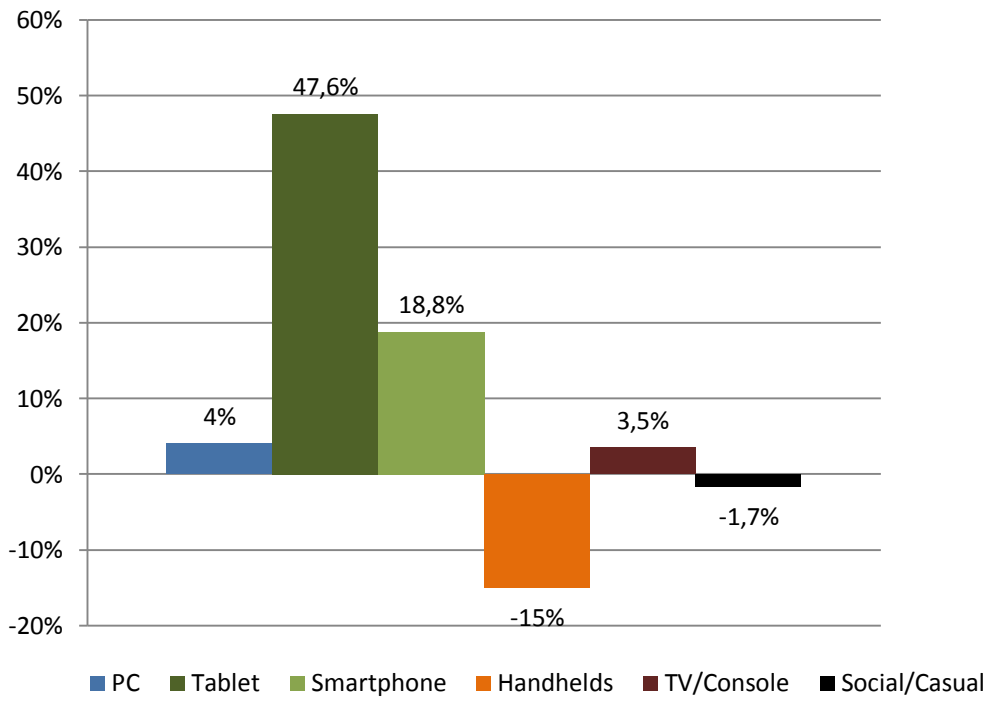

Figure 2-CARGs of all platforms

Video game industry: old and new trends and changes

Until 2008 consumers played games mainly on PC and consoles. However, this trend has changed. Time and money are now distributed along more platforms, such as tablets and smartphones.

According to the screen segmentation model of the video games marketing research firm Newzoo, gamers play on four screens: the entertainment screen that includes the console section, the computer screen that represents the pc gaming section, the floating screen that includes the portable gaming on handhelds and tablets and the personal screen that refers to smartphones. The marketing research firm Newzoo went on segmenting the video games market into four parts for three reasons. First, misleading terminology and disorienting posts of the mass media create an environment of misinformation that is not friendly to the investors. Second, as gamers tend to spend their money among various platforms, videogames companies are obliged to find ways to monetize their projects through as many screens as possible. Third, the single-screen platforms projects can no longer guarantee lasting profits. The budgets are too tight for game companies to base their success on only one screen. By investing in many screens they can reduce the consequences of a failure (Newzoo, 2013).

Literature Review

Game as a Product (GaaP)

Players traditionally buy games in a box from retail stores or from other e-commerce websites such as GAME and GameStop. Players can also pick up and download digital versions of games from digital delivery services such as Steam, Orange, Google Play and App Store (Grutzky & Cederholm, 2010). Players through these distribution channels do not have direct contact with the publishers or the developers (Grutzky & Cederhlom, 2010). The contact with the customers has been outsourced to third party companies. Moreover, games distributed through these channels usually follow the pay-once model and have to make a profit during the first month or sooner (Dyack, 2013; MacDonald, 2013).

Even though, companies like Sony or Microsoft have their exclusive online virtual stores such as PlayStation Store and Xbox Live, the same purchase process occurs in these stores so far without fundamental changes (Grutzky & Cederholm, 2010). The first wave that used these distribution channels was small development studios that also followed the pay-once model. It is notable that digital distribution minimized the cost of stocking and enabled small development studios based on limited resources to take more risks than they normally would, if they had to release their games in retail stores (Lovell, 2010).

In Figure 3 we see Game as a Product model (GaaP). In this model games are separate products for each platform without interoperability. Consequently, computer screen, entertainment screen floating screen and personal screen are separate platforms. Moreover, revenue streams do not take place in-game because publishers adopt mostly the pay-once model (Bourcier, 2012). Therefore, players buy games in a box from retail stores or from e-commerce websites and other distributional channels. Games following this model fails if they do not meet the sales target, within a month, as the cost of

stocking leads to a price drop and replacement from next titles (Grutzky & Cederhlom, 2010).

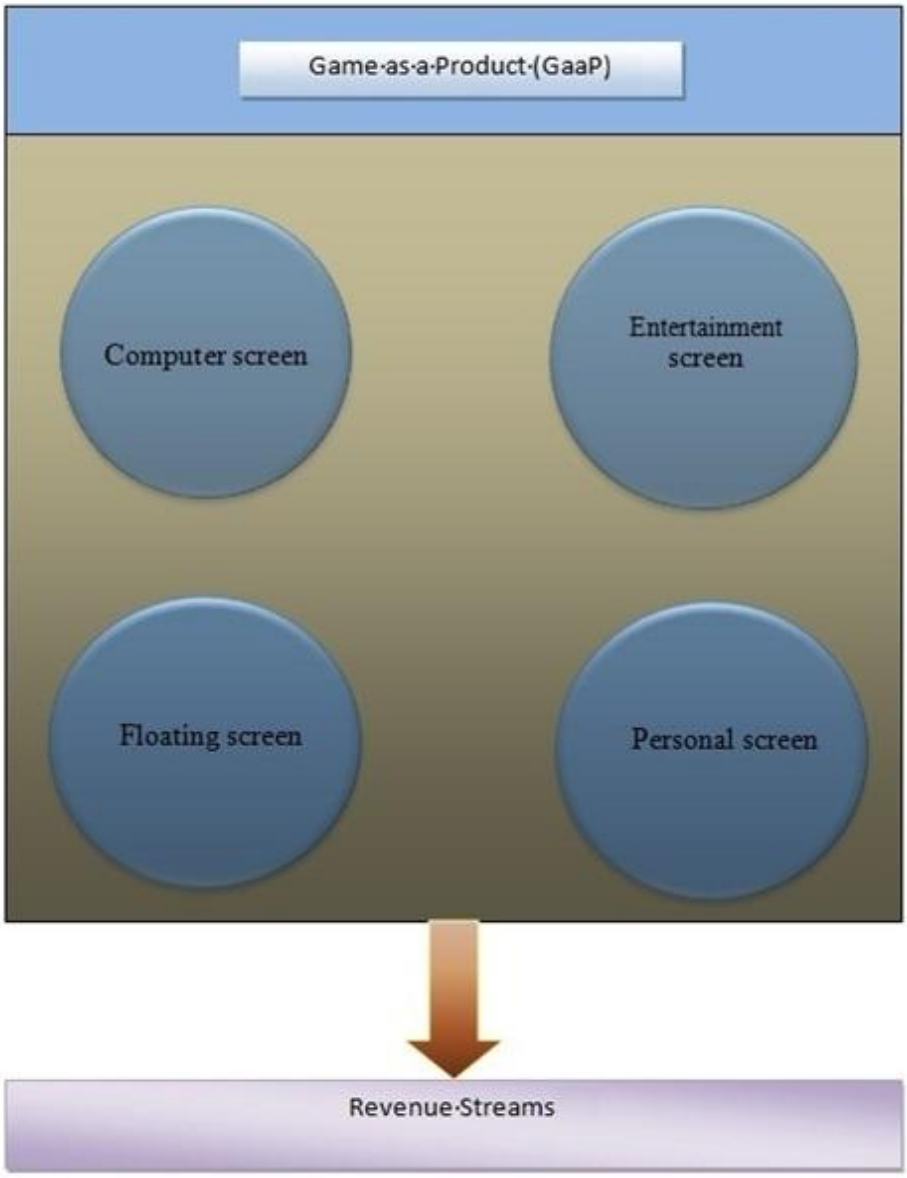

Figure 3 Game as a Product model

Game as a Service (GaaS)

Following the standards of Software as a Service (SaaS) business model and service design thinking, videogames companies now turn games into services following a model, known as the Game as a Service (GaaS) (Kultima, 2009; Stenros & Sotamaa, 2009 (as cited in Sotamaa & Tero, 2010); Bagga, 2011). Video games are now becoming long lasting services, whilst the era of pay-once model, has passed. Video game companies set up thorough and extensive beta tests in order to ensure the game's

quality and get direct feedback from the players, because now the monetization channels occur within the game (Davie, 2012).

Moreover, social network features are integrating into game projects. Even before the advent of social networks, players were creating their own communities by using external communicating channels such as forums, chat rooms and email messages. Nowadays social networks have simplified this process. People create social clusters so as to gain more value from the cluster than they gain alone (Terschluse & Karen, 2009; Koster, 2011). That is why platforms and video games blur the lines between the game elements and the social network features. Communicating and Sharing are the two key features of this connection (Terschluse & Karen, 2009; Rogers, 2011). The importance of sharing is shown in the design for next-generation entertainment and Computer screens. Floating screens also have their own direct connections to social networks as well as personal screens. Video game companies have instant data from social clusters in order to design and monetize content based on interactions and preferences of groups of players.

The expansion of cloud gaming services also reforms all four screens. Many steps have been taken in the development of cloud gaming service. In 2000 G-cluster was the first cloud gaming platform for handheld devices (Ojala & Tyrväinen, 2011). Since then lots of cloud gaming services have showed up such as OnLive or Gaikai (Shea, Jiangchuan, Ngai & Yong, 2013). In 2012 console manufacturer Sony Computer Entertainment spent $380 million to acquire Gaikai, a cloud-based gaming service. During Consumer Electronics Show (CES 2014) Sony announced “PlayStation Now” powered by Gaikai brings cloud gaming services to PlayStation devices, smartphones, tablets and latest Bravia TV models (House, 2014). Microsoft also announced that offers cloud gaming services with Xbox ONE (Bruno, 2013). Both consumers and developers can use cloud computing power. Players enjoy an enhanced experience because the power of the cloud can boost Xbox ONE capabilities, while developers that build games for Xbox can use cloud computing power for free (Bruno, 2013).

Apart from cross platform experiences and augmenting computing power of gaming devices, cloud services also alter the availability of distribution channels and business models. The two most important features of cloud gaming are the easy access

and the flexibility for both gamers and video game companies. For the players, cloud gaming services offer a unique opportunity to have their games available instantly among various platforms. For the companies, according to Donahue (2012) the instant access is the key for the customer acquisition process. It helps companies to understand better who their customers are and what are their entertainment needs. As players no longer have to wait to download data, instant game experiences increase the chances to attract customers. In addition more pricing models become available. So far, retailers demand from publishers certain pricing standards. However as cloud gaming offers an alternative distribution channel, publishers can now set the rules. Swanson (2013) explained that the pay once model does not offer price flexibility. Gupta and Donahue (2012) added that publishers have more customization options for pricing models, because now games are always instant available and publishers can form their own pricing strategies without logistic restrains.

There are also no hardware restraints, as cloud gaming services are not dependent on customers' hardware. Players can experience and purchase video games content on any supported device anywhere. Thus, the power of the cloud contributes to the transformation of video games software items into services (Early, 2012). Kessissian (2012) provided financial results of G-cluster enterprise[1]as an example of cloud gaming services. Especially he noted that the profits of G-cluster were up to 50,000,000 $ while the conversion rate of non-paying players to customers was a 10%. Overall, the results were 10 times bigger than other cloud services.

Another factor that reshapes the videogames industry is the business model innovation. Although, traditional business models still exist at some extent, they must evolve and adapt so as to monetize new gaming audiences. Companies explore and implement new types of monetization in order to convert that broader audience into gaming customers (Newel, 2013; Wallis, 2013).

One of the major changes of the new business models is the fact that now the revenue streams are integrated into games (Bagga, 2011; Bourcier, 2012). Taking into account the flow state of the players, videogames enterprises have designed monetization systems that let player pay while they are playing. Players no longer need to interrupt their gaming experience and quit the game in order to interact with external

[1] G-cluster is a Finnish cloud gaming company.

payment systems. The purchase strategies are not only part of gameplay mechanics but are part of the game development in total.

As companies spread their video game projects among more platforms, at the same time social functionalities, cloud capabilities and business models become a fundamental part of game services. The GaaS model as shown in figure 4 depicts that tendency of integration of all these features in single game services.

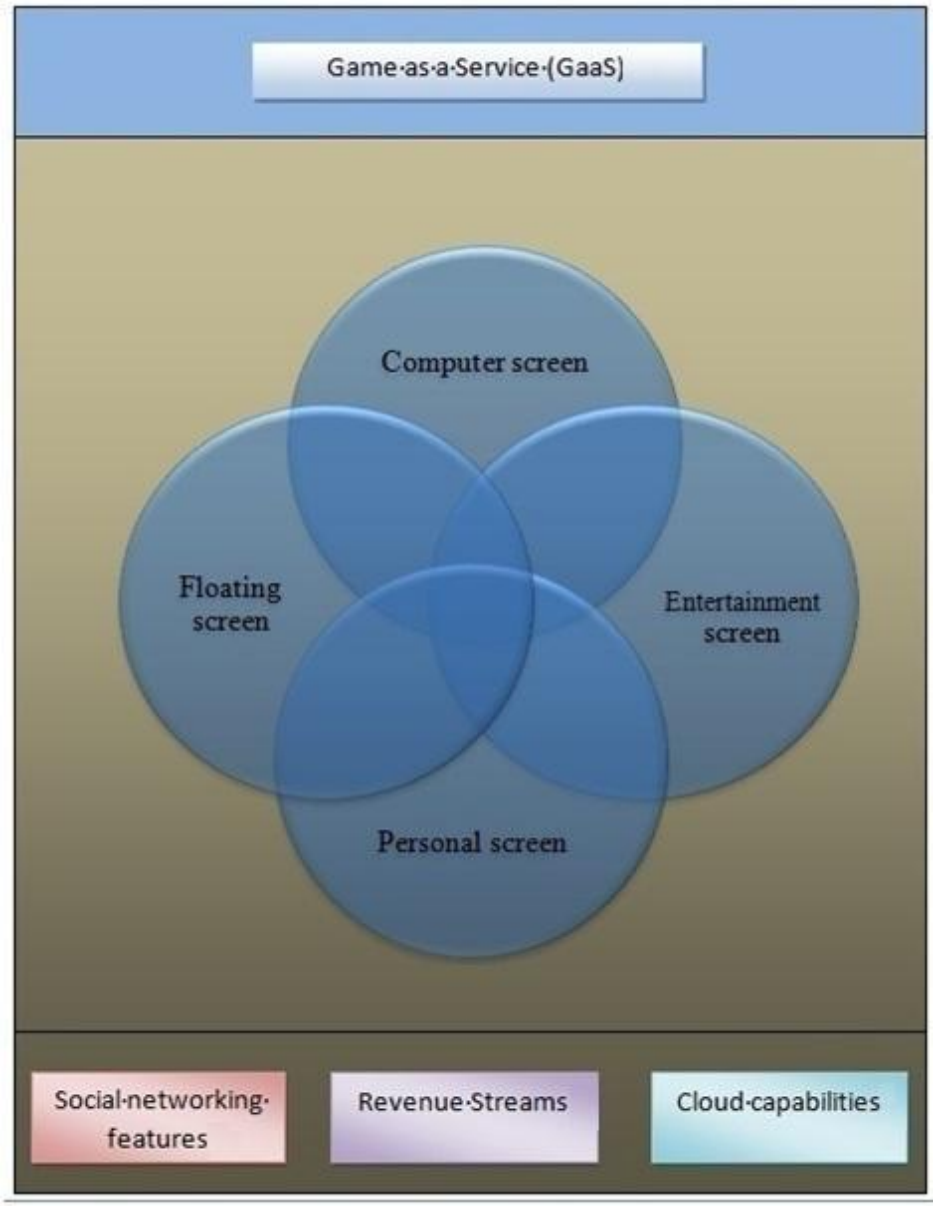

Figure 4 Game as a Service model

Benchmarks and metrics of business models

In order to understand and compare video games business models of game services, benchmarks and metrics are required. However, we have to keep in mind that there are no specific globally accepted metrics (Gazecki, 2012).

The absence of globally accepted metrics and benchmarks is triggered by the differentiation and the uniqueness of each game and its life-cycle. Even if the same kind of games are produced on the same platform, there are going to have different aspects that are important to different metrics. Moreover, videogames have a life-cycle (Gazecki, 2012). Figure 5 depicts the Moore‘s lifecycle adoption model. As a video game product passes through various stages such as the early adoption, the growth and the maturity, business model may change. As a result, each of these phases requires different metrics (Moore, 2001). Hence, there are no global accepted metrics, benchmarks and metrics vary on each video game (Gazecki, 2012).

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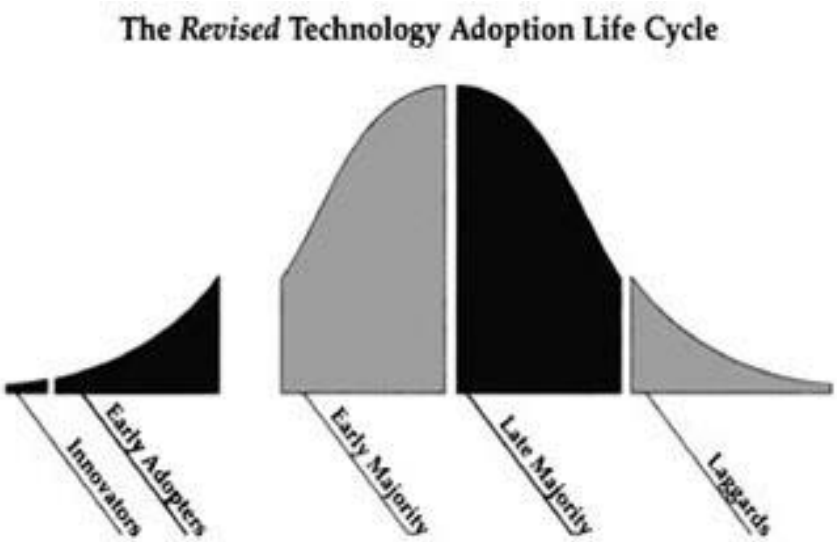

Figure 5 Moore‘s High-Tech Marketing Model - Technology Adoption Life Cycle (Moore, 2001).

Video games Business Models: Theoretical framework

In this section there is a brief presentation of video games business models. We examine the main functionalities of each business model and we present some examples and brief case studies.

Pay-once/Fire and forget model

In the pay-once model, video games companies sell video games to customers through a single transaction in local and online stores. The pay-once model is the most traditional model in the video games industry. There is only one revenue stream and it takes place during the purchase process (Grutzky & Cederhlom, 2010). There is a fixed price for all the customers in each retail or online store and there are no alternatives during the first days of release (Dreunen, 2011).

In Figure 6, we see the evolution of the supply chain for the pay once model. Initially a developer has to find a publisher. Publishers use various distribution channels to deliver the boxed games to local stores for consumers. However, there are some different distribution channels such as the online distribution without a publisher or the direct distribution of the game by the developer. Either way, though all the distribution channels lead to the same single transaction process for the end user (De Prato et al., 2010).

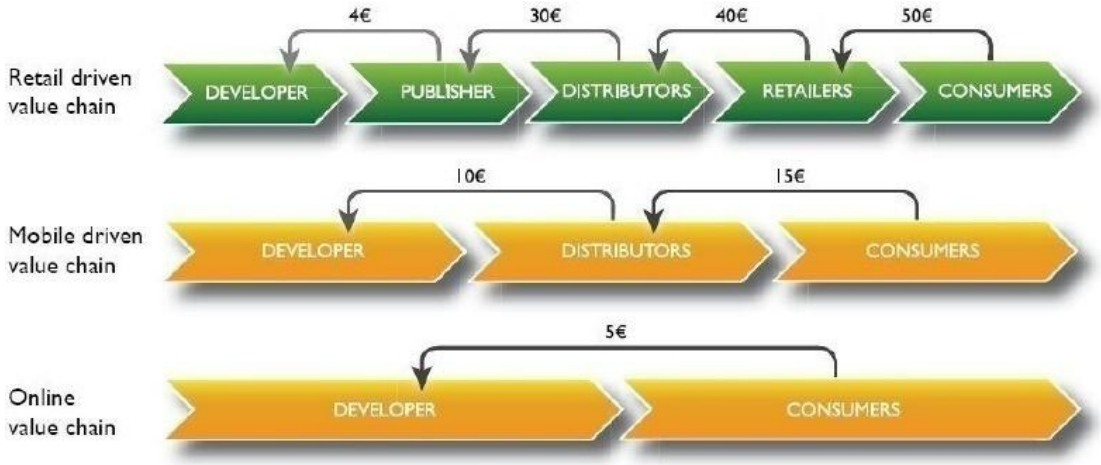

Figure 6 - Value chain evolution (De Prato, Feijóo, Nepelski, Bogdanowic, & Simon, 2010)

Notably, some researchers distinguish the digital from the retail sales of video games that follow the pay-once model (Dreunen, 2011). On the other hand, Bourcier (2012) is a strategic error to divide sales into retail boxes and digital. He suggests that we have to examine the industry as an undivided entity. In both cases, companies apply price-discrimination tactics. Companies set high prices for first served users and drop them after a short period or when a similar product enter the market. As a result, players may opt to buy the game later in order to avoid high prices. However, this consumer behavior is a threat for the business model because it causes losses in the revenue streams (Nair, 2007). As a result, Bourcier (2012) believes that this is a declining business model.

Bourcier (2012) also mentions that the Pareto law (80-20 rule) applies in all fast-moving consumer goods (FMCG), including video games. He provides evidence regarding his statement, by explaining that 4% of all games available correspond to half of the console software sales. Thus, this model is weak for smaller companies and it is more suitable for established game brands.

In the Table 2 we summarize the strengths, weaknesses, opportunities and threats of pay-once/fire and forget business model

Table 2 SWOT analysis of pay-once/fire and forget model

Pay-once/Fire and forget model	
Strengths	**Weaknesses**
• Direct profit for all value chain members (De Prato et al., 2010) • Enables price-discrimination tactics (Nair, 2007)	• Single transaction model (Grutzky & Cederhlom, 2010) • Only one revenue stream (Grutzky & Cederhlom, 2010) • Fixed price during early days of release (Dreunen, 2011)
Opportunities	**Threats**
• Suitable for established game brands (Bourcier, 2012)	• Late majority buyers (Nair, 2007)

In-Game advertising

In the in-game advertising model, enterprises pay publishers and development studios in order to advertise their products and services in virtual worlds of video games. Ads may reflect specific brands that appear in virtual goods or can be incorporated as elements of games (Vedrashko, 2006).

SWOT analysis

We identify as strength of in-game advertising model the direct revenue stream. Video game companies make direct profit from partnership with the advertised companies (Lewis, 2006). Weakness of this model is permanent ad placement. If ad placement is static even if it is required, it cannot be removed (Steiner, 2008). Opportunity of this model is the experience enhancement. Suitable in-game advertisements can enhance players' alternate reality (Vedrashko, 2006). Threat for this

model is unsuitable advertised brands. Players may feel that advertised brands are not associated with certain game type (Boyd & Lalla, 2009).

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Table 3 SWOT analysis of In-Game advertising model

In-Game advertising	
Strengths	**Weaknesses**
• Direct revenue stream (Lewis, 2006)	• Permanent ad placement (static) (Steiner, 2008)
Opportunities	**Threats**
• Experience enhancement (Vedrashko, 2006)	• Unsuitable advertised brands (Boyd & Lalla, 2009)

Ad placement can be either Static or Dynamic. Static product placement is the introduction of permanent advertising messages in the game. An example of static product placement is the advertisement displayed in motorsport and sports games. In image 1 there are in-game ad placements that cannot be changed (Zalewski, 2009).

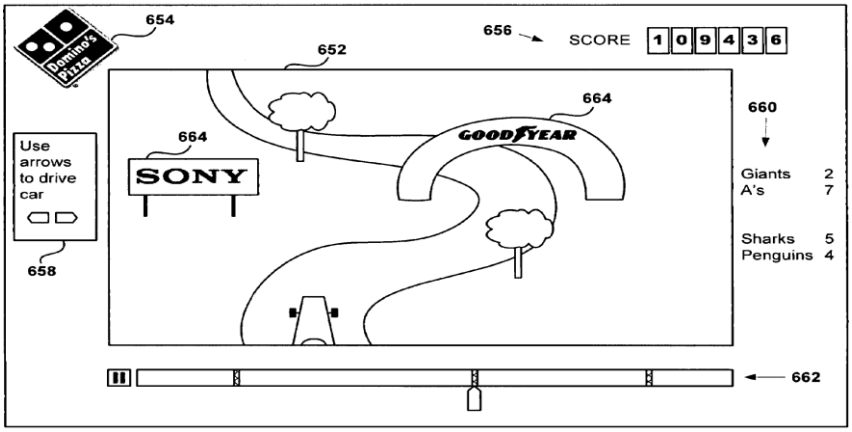

Image 1 - Ad placement patent (Zalewski, 2009)

Dynamic product placement is different to Static placement because we can dynamically change the content of the ads. The elements of a dynamic product placement may vary in terms of location, date and player's profile. For example, in image 2 Sony patent dynamically shows different advertisements based on gender (Zalewski, 2009).

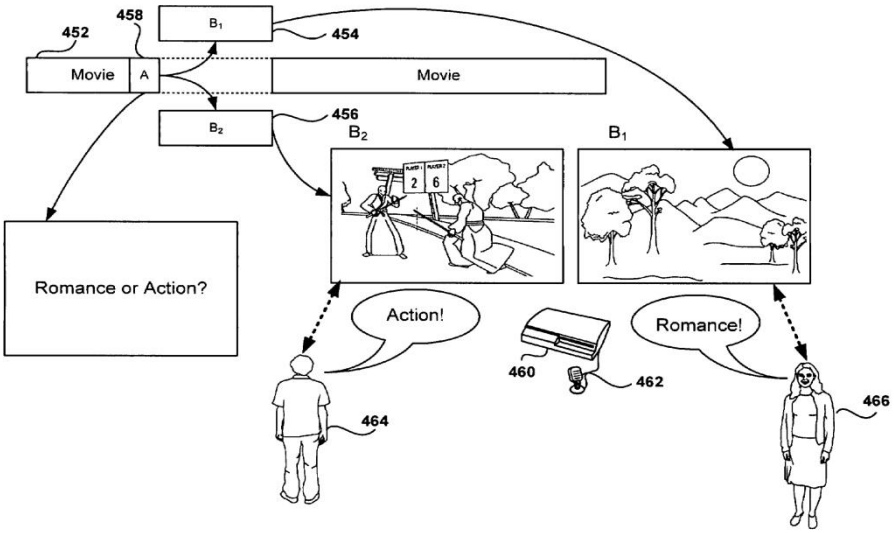

Image 2 - Interactive ad placement patent (Zalewski, 2009)

Advergames

Advergames are video games that their sole purpose is to advertise a product, a brand or an organization (Heide Smith and Nørholm, 2009). Advertised companies usually fund development studios to cover production costs. According to this model, when development studios complete game production, advertised companies distribute it for free or for a small fee (Steiner, 2008).

SWOT analysis

We identify as strength of advergames the low production and development cost. Generally, advergames development is relatively easy for video game companies (Steiner, 2008). Weakness for advergames is the fact that most advergames are single player games (Steiner, 2008). As a result, there are no network externalities. Opportunity for advergames model is the fact that possible revenue depends on video game company's reputation (Perry & DeMaria, 2009). A threat that we face in this

model is that full-length advergames are very difficult to develop. As a result, development it is difficult for inexperienced development studios (Steiner, 2008).

Advergames	
Strengths	**Weaknesses**
• Low production and development costs (Steiner, 2008)	• Single-player games (Steiner, 2008)
Opportunities	**Threats**
• Reputation determines possible revenue (Perry & DeMaria, 2009)	• Full-length advergames' development very complex (Steiner, 2008)

Example

A prime example of Adver-Games is Burger King games. Burger King company made a partnership agreement with Microsoft about releasing three adver-games on X-box and X-box 360 consoles. The cost for each game was 3.99 $ and 10.99 $ as a set. It is worth to note that each disc included versions for both consoles (Miller, 2006).

User Generated Content (UGC)

In user-generated content business model videogame companies make profit from the intellectual property rights of players' created content Video game enterprises sell it to other players as an expansion of their service or product. They also sell it to other companies as a new intellectual property (Di Gangi & Wasko, 2009). Moreover, video game enterprises charge players for trading created content. Revenue for video game enterprises, in that case, derives by keeping a percentage of the transactions (Searle, 2011).

SWOT analysis

We identify as strength of this model the further exploitation of game content without additional investment (Di Gangi & Wasko, 2009). A weakness of this model is players' skills because model's efficiency depends on players' development skills (Anderson, 2014). Moreover, an opportunity of this model is the direct involvement of players. Players participate in game production and in some cases they can make profit (Searle, 2011). Possible threats for the user generated content model are the unsuitable game content and the unclear legal ownership. Players can create game content that could damage the game's brand (Anderson, 2014). Additionally, terms of legal ownership of the created game content may not be clear (Kow & Nardi, 2010).

Table 4 SWOT analysis of user generated content model

User Generated Content	
Strengths	**Weaknesses**
• Further exploitation of game content without additional investment (Di Gangi & Wasko, 2009)	• Efficiency of this model depends on players' development skills (Anderson, 2014)
Opportunities	**Threats**
• Players' involvement (Searle, 2011) • Players can make profit (Searle, 2011)	• Unsuitable game content can damage the game's brand (Anderson, 2014) • Unclear legal ownership terms (Kow & Nardi, 2010)

Case study

An innovative example of user generated content model is the free-to-play game EverQuest Next Landmark by Sony Online Entertainment (SOE). In EverQuest Next Landmark players will have the opportunity to create game content that the development studio may eventually decide to incorporate into its main game EverQuest Next. Thus, the company follows a reverse game development process by creating and getting the community involved with the game prior to its release date. In EverQuest

Next Landmark players have the opportunity to learn how to create and sell game content to other players through the Player Studio, which is the community shop of Sony Online Entertainment (Georgeson, Murphy, & Michaels, 2013).

Video Games Betting

In this group of videogames business models there is a partnership between third-party companies who organize game tournaments and developers or publishers. This business model is based on the competitiveness of the players. Players can legally (where it is allowed) enjoy their games by betting money or virtual items to win real rewards. Revenue in video games betting models derives from the sales of virtual goods and competition participation fees (Levin, 2009).

Player to Player Wagering

According to this model, before players start competing against each other on video games, they bet money or virtual goods. After competing against each other on a game the winner takes all the bets The higher the competition, the higher the bets will be. Video game companies gain revenue from this process by selling virtual items to tournament organizers or directly to players (Perry & DeMaria, 2009).

SWOT analysis

We identify as strength of this model the positive relationship between competition and bets for virtual goods/money (Perry & DeMaria, 2009). A weakness of this model is related to legal issues because videogames betting is forbidden in some countries (Harris, J., & Hagan, 2012). An opportunity for this model is the fact that virtual items become obsolete after some time. As a result, video game companies force players to purchase new items, even if they are winning (Perry & DeMaria, 2009). A possible threat for this model is cheating (Yan & Randell, 2005; Perry & DeMaria, 2009). Players try harder to cheat if prizes involve real money (Perry & DeMaria, 2009).

Table 5 SWOT analysis of player to player wagering

Player to Player Wagering	
Strengths	**Weaknesses**

• Positive relationship between competition and bets for virtual goods/money (Perry & DeMaria, 2009)	• Legal issues (Harris, J., & Hagan, 2012)
Opportunities	**Threats**
• Virtual items become obsolete after some time (Perry & DeMaria, 2009).	• Cheating (Yan & Randell, 2005; Perry & DeMaria, 2009)

Example

An example of this model is the venture between WorldGaming.com and Virgin Group, virgin's gaming service. The Virgin Gaming service is working in partnership with Electronic Arts, Ubisoft and other video game companies. This collaboration enables players to play and compete against each other in their favorite games for real money, cash and prizes (virgingaming.com, 2013).

Skill-Based Progressive Jackpots

In this model, players pay a participation fee (real money or virtual items) and enter a tournament – game. After the payment process, a progressive jackpot is triggered and the player can win a sum of money or virtual items to be spent on bets if he/she fulfills some content game conditions. Third-party enterprises, publishers and development studios gain revenue from this process by keeping a percentage of total fees and the charges for virtual items. The main difference between gambling and this business model is the fact that it tests players' skill and it is not purely luck-based (Perry & DeMaria, 2009).

SWOT analysis

We identify as strength of this model the increased competition. Players participate more frequently and compete harder if there is involvement of real prizes

(Perry & DeMaria, 2009). On the other hand, a weakness of this model is related to legal issues. Videogames betting models are not legal in all countries (Harris & Hagan, 2012). An opportunity for this model is that tests players' skill and it is not based on pure luck factor (Perry & DeMaria, 2009). A possible threat for this model is that players try harder to cheat if there is involvement of real prizes (Yan & Randell, 2005; Perry & DeMaria, 2009).

Table 6 SWOT analysis of skill-based progressive jackpots

Skill-Based Progressive Jackpots	
Strengths	**Weaknesses**
• Increased competition (Perry & DeMaria, 2009)	• Legal issues (Harris & Hagan, 2012)
Opportunities	**Threats**
• Skill based (Perry & DeMaria, 2009)	• Cheating (Yan & Randell, 2005; Perry & DeMaria, 2009)

Case study

An example of this business model is the Space Tale game from Boss Media. Special Tale is a video slot game with bonus rounds based on certain players' skills. The game has a progressive jackpot and the players win if they line two to five jackpot gems on an active line. In order to play the game, players need up to 90 virtual coins, which according to their size cost from $ 4.50 to $ 90. Although, it is a slot game, there is a bonus round for every 1000 points. In a bonus round, the gameplay changes completely. Players use key arrows to guide a spacecraft and hit targets so as to win up to 10000 coins (casinoclub.com).

Sponsored Games / Donationware

In the donationware model philanthropists, state or charity organizations financially support video game companies which develop Serious Games (videogames that help players acquire new skills, or improve the world) (Perry & DeMaria, 2009; Mehdi, Elmaghraby, & Ch'ng, 2009). Moreover, if a development studio has a strong social impact, charity organizations may opt to sponsor its games (Mehdi et al., 2009).

SWOT analysis

We identify as strength of this model the strong social impact. Players financially aid the development of videogames that someway help society (Perry & DeMaria, 2009). A weakness of this model is its limited use. Videogame companies adopt this model in order to develop Serious Games (Perry & DeMaria, 2009). An opportunity for this model is the collaboration with philanthropists, state or charity organizations (Perry & DeMaria, 2009; Mehdi et al., 2009). If a development studio has a strong social impact Charity organizations may opt to sponsor its games (Mehdi et al., 2009). A threat for this model is its non-profit goal. Perry and DeMaria (2009) warn videogame companies to make sure that donations cover development and distribution costs because videogame companies that adopt this model barely make money.

Sponsored Games/Donationware	
Strengths	**Weaknesses**
• Strong social impact (Perry & DeMaria, 2009)	• Limited to Serious Games (Perry & DeMaria, 2009)
Opportunities	**Threats**
• Collaboration with philanthropists, state or charity organizations (Perry & DeMaria, 2009; Mehdi et al., 2009)	• Non-profit goal (Perry & DeMaria, 2009)

Case Study

An example of this model is the Decode Global‘s game Get Water! on iOS devices. Get Water! is about navigating a little girl, Maya, through the slums where she lives, so as to complete tasks and find clean water. Players can help her not to get distracted from school in her quest to find water, by making some in-app purchases. This happens because Decode Global donates all the proceeds from in-app purchases to

non-profit organizations that help people in developing countries to have access to clean and safe water (decodeglobal.org, 2013).

Crowdfunding

In the crowdfunding model a development studio presents its project on a crowdfunding platform and requests financial support. Players who want to support that project have to pay an initial amount of money before the development of the game has begun or while it is at its initial stages (Hemer, 2011; Agrawal, Catalini, & Goldfarb, 2013). Crowdfunding platforms (such as kickstarter or indiegogo) work as the middle man and gain revenue from this process by applying a percentage fee to the funds collected, only if funding is successful. If funding is not successful, there are no fees and the crowdfunding platform is not liable for any damage or loss relating to the project. In that case it is up to players who funded the game to take legal action. If the project reaches its monetary goals, players after some time gain access to physical game content or virtual items according to the amount of money they pledged. If the project fails no fees are applied (Hemer, 2011; Agrawal et al., 2013).

SWOT analysis

We identify as strengths of this model the better matches and the information that crowdfunding generates. Through crowdfuning platforms videogame companies can find better matches about the players who are the most willing to fund their projects. (Hemer, 2011; Agrawal et al., 2013). Moreover, crowdfunding generates more information compared to other early fundraising models because videogame companies have direct communication with players before and during game production (Agrawal et al., 2013. The weaknesses of this model are frequent and the creators' incompetence. Creators may lack the skills in predicting development costs, handling logistics etc. Players may have to wait for long before they actually see the project completed (Agrawal et al., 2013). The opportunities of this model are the monetization of early access and community participation to entrepreneurial initiative. Videogame companies can monetize the early access to their projects in this model while players have the

opportunity to feel they take part in an entrepreneurial venture (Agrawal et al., 2013). The threats of crowfunding model are the collective action problem and the project risk. Collective action problem refers to the fact that if investment levels are low players will hesitate to take part in the project. As a result, players may wait one another and nobody invests. Moreover, ventures that are at their early stages are inherently risky (Agrawal et al., 2013).

Table 7 SWOT analysis of crowdfunding model

Strengths	**Weaknesses**
• Better matches (Agrawal et al., 2013). • Information (Hemer, 2011; (Agrawal et al., 2013)	• Often delays (Agrawal et al., 2013). • Creators incompetence. (Agrawal et al., 2013)
Opportunities	**Threats**
• Early access (Agrawal et al., 2013) • Community participation (Agrawal et al., 2013)	• Project risk (Agrawal et al., 2013) Collective action problem (Agrawal et al., 2013)

Case study

Torment: Tides of Numenera was a Role-playing game from inXile Entertainment. Torment: Tides of Numenera was the most crowfunded Kickstarter videogame project and was successfully funded in the first six hours. More than 70.000 backers pledged more than $ 4.180.000 during 30 days. Players could back the project by pledging $ 5 to $ 350 for virtual items and $ 165 to $ 10.000 for physical goods (kickstarter.com, 2013).

Subscription

In the subscription model, players pay a subscription monthly, quarterly or on an annual basis. Players may also need to buy a part of the game, either online or in physical form. The revenue stream of this model is based on continuous membership

(Nojima, 2007). However, in most cases a user can unsubscribe for some time without losing his achievements and progress (Perry & DeMaria, 2009).

SWOT analysis

We identify as strengths of the subscription model the recurring revenue and the predictable revenue. Players' continuous membership offers videogame companies recurring revenue (Nojima, 2007). Moreover, the subscription business model enables enterprises to better make better predictions because of exepcted revenue (Sullivan, 2011). A possible weakness of the flat-rate subscription model is that you gain the same value from all the players (Nojima, 2007). Opportunities of this model are the diversifying price model and the continuous relationship with the company. Subscription based games offer videogame companies various pricing model options such as prepaid or flat-rate (Nojima, 2007). Moreover, companies and subscribers establish a continuous relationship. As a result, companies can collect more information about subscribers' profile revenue (Sullivan, 2011). A possible threat of this model is the fact that retention depends on immersion. If players stop feeling immersion then they abandon the game (Langlotz, Rhode, & Whaley, 2008).

Table 8 SWOT analysis of subscription model

Subscription	
Strengths	**Weaknesses**
• Recurring revenue (Nojima, 2007) • Predictable revenue (Sullivan, 2011)	• Same value from each of your customers (flat-rate) (Nojima, 2007)
Opportunities	**Threats**
• Diversifying price model (Nojima, 2007) • Continuous relationship (Sullivan, 2011)	• Retention depends on players' continuous immersion (Langlotzl et al., 2008)

Case Study

A prime example of a successful subscription based game is World of Warcraft a game by Blizzard Entertainment. Blizzard Entertainment first released the World of Warcraft in 2004 as a subscription based MMORPG and still follows the same business model. Nowadays, there are three available subscription options. The players can buy one month game time for 12.99 €, 3 months game time for 11.99 € and 6 months for 10.99 €. In 2008 World of Warcraft was estimated to hold 68% of the total subscription based MMORPG market (Videogamedesigncolleges.org, 2011). By 2010 Blizzard had 12.000.000 subscribers (figure 7). Today subscribers are dwindling (statista.com, 2013). Various researchers and employees of Blizzard such as Tom Chilton[2] suggest that Blizzard should change its business model and follow a combination of virtual items transactions and free-to-play models (Chilton, 2013). On the other hand, Jason Hutchins[3] underlines the fact that the game is not built for a free to play model and that the stable player base along with the subscription model keeps the game successful all these years (Hutchins, 2013).

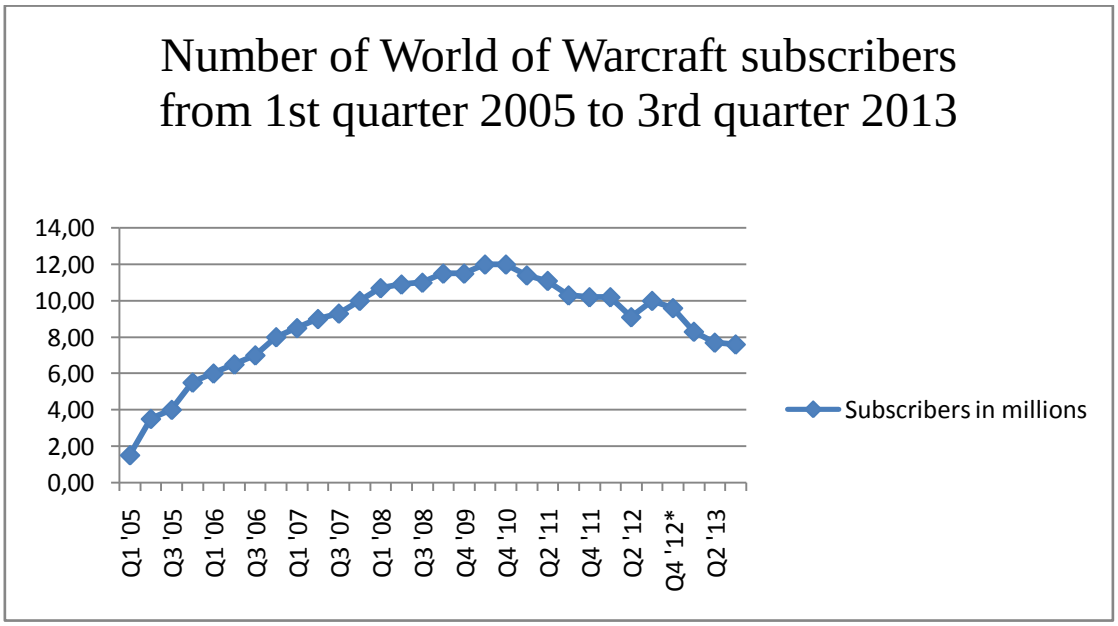

Figure 7- Number of World of Warcraft subscribers from 1st quarter 2005 to 3rd quarter 2013 (statista.com, 2013)

[2] Tom Chilton is the lead designer of World of Warcraft
[3] Jason Hutchins is the senior game producer of World of Warcraft

Pay per play / Pay as you go / Pay per time

In the pay per time business model video game companies charge players for the time they played the game. Depending on a fee schedule, charges can differ. Players can use some in-game items that reduce the charge per hour for a certain time limit. However, the player usually has to spend many hours before he/she can acquire them (Perry & DeMaria, 2009; Ojala, 2012).

SWOT analysis

We identify as strengths of pay per play / pay as you go / pay per time model are the continuous revenue stream and the diversification of user base. In this model video game enterprises make profit all the time players spend on video games (Harris, 2012). The weaknesses of this model are that there is the same price for all customers and the need to maintain records of usage. There are no personalized pricing options because enterprises charge all the players the same. Moreover, enterprises may need to keep records of usage. Consequently, there is an increase in administrative costs (Ojala, 2012). An opportunity for this model is diversification of user base. Games are available to players who play occasionally or for some specific purpose (Ojala, 2012). Threats for this model are the overuse of the product and the low switching costs. If a player plays for too long, total charges may be extravagant. As a result, the player may opt to quit playing (Harris, 2012). Another threat is low switching costs. Players can switch games if there is an alternative option available at a lower price (Ojala, 2012).

Table 9 SWOT analysis of pay per play / pay as you go / pay per time model

Pay per play / Pay as you go / Pay per time	
Strengths	**Weaknesses**
• Continuous revenue stream (Harris, 2012).	• Same price for all customers (Ojala, 2012) • Need to keep records of usage (Ojala, 2012)
Opportunities	**Threats**
• Diversification of user base (Ojala,	• Overuse (Harris, 2012).

2012)	• Low switching costs (Ojala, 2012)

Case study

The GemStone III is MUD[4] game which first appeared as GemStone in 1987 as part of the online service Genie[5]. During the first years of release the business model Genie followed the "pay per hour" model. Players had to pay for every hour they were spending in the game and charges varied according to a fee schedule. The initial cost of the service was 6 $ per hour during times of low demand (evening hours and weekends) while during times of high demand the cost elevated at 36 $ per hour. While playing GemStone III, players had the chance to win real gemstones if they had previously found them in-game. As a result, this marketing policy urged players to play more hours (Coyier, 2009).

Neil Harris (2012) mentioned that the success of this business model is based on the pleasure that players receive while playing an online video game. Indeed, the more fun a game offers, the more time players spend on it. As a result, that eventually lead them to pay more as well.

[4] MUD: MUD games were online RPGs that didn't have any user interface and the interaction among the players was achieved only using command line.
[5] Genie: General Electric Network for Information Exchange: it is an ASCII text-based department of General Electric, which began in 1985 and ended in 1999

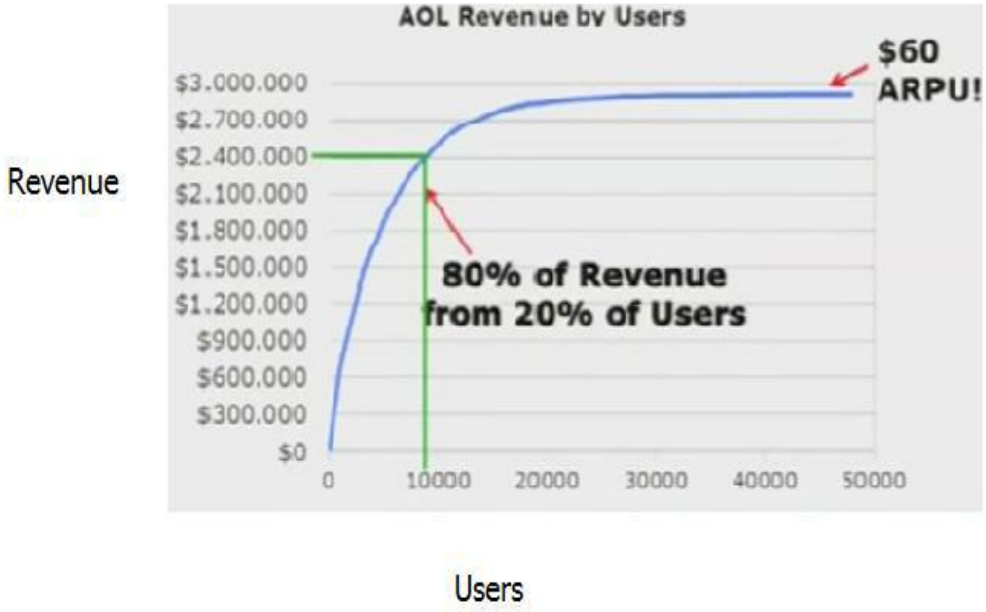

Figure 8- Revenue of GemStone III, March 1996 (Harris, 2012)

In figure 8 we see the results of GemStone III with this business model. In 1996 there were 50.000 players in total paying 6 $/hour, that yielded AOL 3.000.000 $ in a month. During that period, the contract between Simutronics and AOL enabled the developer team of GemStone III to earn 20% of the profit while AOL claimed 80%. Moreover, this 80% of the profit, which was 2.400.000 $ was earned by 10.000 users which corresponds to 20% of the total users. This also led GemStone III to have an Average revenue per user (ARPU) up to 60 $.

Taking into account the available data, players of GemStone III spent most of their available time playing the game. Actually, they spent almost 400 hours per month on GemStone III and they paid 2.400 $. However, many of them after reaching a certain amount of hours, stopped playing (Harris, 2012).

Bitcoin mining as a means of payment

In the bitcoin mining as a means of payment model, a player downloads and installs a mining client. Then, that mining client starts generating a certain number of bitcoins, which change into real money. Eventually, the mining client provider takes a cut of the money and pays the game company which in exchange, provides players with in-game currency, cheaper monthly subscription fees or virtual items (Farivar, 2012).

SWOT analysis

We identify as strength of this model the continuous revenue stream. As long as players keep the mining client installed, video game companies make profit (Farivar, 2012). Weaknesses of this model are minimum mining process requirements. It is unlikely all players to have powerful devices enough to meet mining process requirements (Koss, 2012). As a result, players on weaker systems reject the idea. Opportunity for this model is the participation of non-paying players (Bishop, 2012). Threats for this model are related to legal issues of bitcoin and bitcoin unstable exchange rate. Speculative investors dominate bitcoin network and cause bitcoin exchange rate volatile fluctuations. Moreover, various financial institutions warn consumers and investors about possible security threats of virtual currency such as fraud or illegal activity engagement (Elwell, Murphy, & Seitzinger, 2013).

Table 10 SWOT analysis of bitcoin mining as a means of payment model

Bitcoin mining as a means of payment	
Strengths	**Weaknesses**
• Continuous revenue stream (Farivar, 2012)	• Mining process requirements (Koss, 2012)
Opportunities	**Threats**
• Participation of non-paying players (Bishop, 2012)	• Security concers (bitcoin) (Elwell et al., 2013) • Unstable exchange rate (bitcoin) (Elwell et al., 2013)

Case study

A pioneer of this model is Coinlab, a start-up company that wants to offer an alternative game monetization service by using bitcoin mining process. Coinlab's new

tagline is “All your gamers are gold” According to Coinlab’s calculations, the average gamer generates 50 cents to $2 per day or about 15 $ per month. That numbers are impressive for some game companies, because non-paying players can now bring more revenue than paying customers (Bishop, 2012). Moreover, this business model can offer 50 times average revenue per user compared to advertisements (Vessenes, 2012). Wurm Online and Grafighters have already partnered with CoinLab and more companies are expected to follow (Koss, 2012).

Free to play (F2P)

The games based on the free to play model allow players to have free access and try the game. This model is used to attract players, without a fee barrier, as no costs are involved. Thus the free to play model is combined with other business models such as microtransactions (Weidemann, 2011).

Microtransactions

In the microtransactions business model video game companies gain revenue by selling virtual items to players. Virtual items may already exist in a game or they can be exclusive additional content. In this way video game companies can add value to their games even after the release date (Hamari & Lehdonvirta, 2010).

SWOT analysis

We identify as strength of microtransactions business model the power of choice (Oh & Ryu, 2007). Players have the power to specifically choose what game items they want to buy. Weakness of this model is that players may feel dimed about microtransactions (Epps, Muligan, & Hood, 2009). This happens because some players think microtransactions as a pay to win method and not as an additional option. Opportunities for this model are the personalized pricing, the scarcity and the added value. Harris (2012) suggested that video game companies should follow a personalized

pricing in microtransactions by creating and charging virtual items based on each player's needs. Moreover, video game companies can offer virtual items transactions in order to exploit the scarcity of certain in-game items (Hamari & Lehdonvirta, 2010). Video game companies can also add virtual items in their released games in order to increase their value or alter the content (Hamari & Lehdonvirta, 2010). Threat for this model is related to in-game balance issues. The implementation of virtual items can alter the game's economy and affect game mechanics. Thus, video game companies should examine the consequences of changes carefully and schedule the adequate game updates, if necessary (Hamari & Lehdonvirta, 2010).

Table 11 SWOT analysis of microtransactions

Microtransactions	
Strengths	**Weaknesses**
• Power of choice (Oh & Ryu, 2007)	• Players may feel dimed (Epps et al., 2009)
Opportunities	**Threats**
• Added value or alteration of content after release (Hamari & Lehdonvirta, 2010) • Scarcity (Hamari & Lehdonvirta, 2010). • Personalized pricing (Harris, 2012)	• In-game balance issues (Hamari & Lehdonvirta, 2010).

As far as the payment process is concerned players can buy virtual items with real money. However, in some cases players have to buy virtual currency before acquiring any virtual items (Oh & Ryu, 2007). According to Hamari and Lehdonvirta (2010) a common pricing strategy is to set the prices of virtual items at a level that leave customers with an amount of change that they cannot use it for further purchases. As a result, players have to buy more virtual currency, if they want to buy more virtual items.

Case study

From 1997 Gran Turismo series followed only the pay-once model. However Gran Turismo 6 the latest installment in the series is the first which adopts two models: the pay-once model and the microtransactions model (Karmali, 2013). Players who bought a copy of the game, they could save time and effort by purchasing virtual currency ("Credits"). In that way players could spend their Credits on buying new cars for their virtual collection. Yoshida (2013) stated that the game was not built around microtransactions. He further explained that microtransactions was an alternative, optional way to play the game. Specially players who did not have the time and preferred to buy rather than to unlock the virtual cars. Taking into account the price list of In-Game Credits if the player wanted one of the top priced virtual cars, for example the Jaguar XJ13, which cost 20 million credits, he/she would have to spend 150 € (sonyentertainmentnetwork.com, 2013)

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Table 12 Price list of In-game Credits (sonyentertainmentnetwork.com, 2013)

Number of In-Game Credits	Price
500.000	4.99 €
1.000.000	9.99 €
2.500.000	19. 99 €
7.000.000	49.99 €

We realize that the cost of a single virtual car was more than twice as high as the Manufacturer's Suggested Retail Price (MSRP) for the game which was 59.99 € (sonyentertainmentnetwork.com, 2013). However, we have to note that the microtransactions model faced serious challenges in Gran Turismo 6, because in-game inconsistencies enabled players to cheat and earn millions of Credits without effort (Matulef, 2013). As a result, game economy became unbalanced and there was no motive for purchasing Credits due to such technical problems.

Virtual items transactions in business models

Table 13 Virtual items transactions in business models

Business models	Virtual items transactions in revenue streams
Pay-once/Fire and forget	-
In-Game advertising	-
Advergames	-
User Generated Content	☑ (possible) (Di Gangi & Wasko, 2009)
Player to Player Wagering	☑ (possible) (Perry & DeMaria, 2009)
Skill-Based Progressive Jackpots	☑ (Perry & DeMaria, 2009)
Sponsored Games / Donationware	☑ (possible) (Perry & DeMaria, 2009; Mehdi et al., 2009)
Crowdfunding	☑ (Hemer, 2011; Agrawal et al., 2013)
Subscription	-
Pay per play / Pay as you go / Pay per time	-
Bitcoin mining as a means of payment	☑ (Farivar, 2012)
Microtransactions	☑ (Hamari & Lehdonvirta, 2010)

In table 13 we notice that more than half of videogames business models involve virtual items transactions in their revenue streams. Especially, microtransactions, bitcoin mining as a means of payment, sponsored games / donationware, user generated content, player wagering, skill-based progressive jackpots and crowdfunding models involve virtual items transactions in their revenue streams.

As a result, virtual items transactions play a significant role in these videogames business models. Therefore, the players' intention to buy virtual items can affect the revenue streams of these models. Thus, by examining the factors of players' intention to buy virtual items we better understand the role of virtual items as a factor of

success of business models. Furthermore, by examining acceptance models of virtual items, we also understand what factors are important for players' adaptation to videogames business models which include virtual items transactions.

Theoretical Background of research model

We used technology acceptance models (TAM) in order to examine the acceptance of virtual items acquisition model and virtual items purchase drivers.

The basis of the technology acceptance models is the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975). The Theory of Reasoned Action (TRA) is a social psychology approach that defines the theoretical framework of human reactions. The most fundamental element of this concept is the possibility of the actor to perform as it was predicted that he/she would intent to react. The two underlying factors that determine the behavioral intention is the individual attitude and the subjective norm (Ajzen & Fishbein, 1980). The individual attitude refers to the tendency someone has to like or dislike something (Fishbein & Ajzen, 1975). While the subjective norm refers to the personal judgment about the acceptance of actor's behavior (Franzoi, 2003).

The evolution of TRA was the Technology acceptance model (TAM) that was first introduced by Davis (1989). According to TAM the acceptance of information technology depends on two factors: perceived usefulness (PU) and perceived ease of use (PEOU). The perceived usefulness refers to the personal belief that the usage of the information system (IS) enhances user's technical skill while the perceived ease of use refers to the difficulty level of adoption. Hsu and Lu (2004) suggested that more external variables can be added and adaptations of the model can occur in order to have a better control of behavioral intentions.

Based on TRA Ajzen (1991) introduced another method the Theory of Planned Behaviour (TPB). This model defines the behavioral intention using three variables the behavior, the subjective norms and the perceived behavioral control.

You & Park (2010) suggested that TAM has quite an explicative power However, TAM compared to TBP has been found to be more suitable for the acceptance

of information systems in the medical sector (Chau & Hu, 2002). Moreover, according to Wu and Liu (2007) TRA may be more adequate for examining entertainment technology such as online games, whereas TAM is not likely to be so effective. Hence, these and other studies have concluded that the comparison among TAM, TRA and TPB have not provide clear outcomes yet (Dishaw & Strong, 1999; Davis, Bagozzi, & Warshaw, 1989).

Venkatesh et al. (2003) have gathered and examined various factors and IS acceptance models in order to develop a unified model, the Unified Theory of Acceptance and Use of Technology (UTAUT). UTAUT's four core constructs were effort expectancy, performance expectancy, social influence and facilitating conditions. However, only effort expectancy, performance expectancy, social influence are determinants of behavioral intention. Performance expectancy refers to the degree to which a user believes that using an information system will help him or her increase his or her job performance. Effort expectancy refers to the usability of the information system. Social influence refers to the degree that a user believes that he or she should use a new information system because important others believe he or she should do that. Guo and Barnes (2007) suggested that web-based transaction platforms have a lot in common with these IS acceptance models. Based on UTAUT, Guo and Barnes (2007) reconceptualized and expectancy, performance expectancy, social influence in order to examine players' purchase behavior intention (PBI).

Lin and Sun (2007) depicted that the virtual worlds enterprises should find another revenue stream apart from subscription fees, by selling virtual items. These items can be aesthetic only or can be more practical in order to improve user's experience. Online games according to Curtis (1992) are virtual worlds that allow interaction among multiple players. Based on TAM, TPB, UTAUT and other technology acceptance models, Guo & Barnes (2007) were the first who developed a research model that defined the purchase behavior in virtual worlds. Guo and Barnes (2009) expanded their initial theoretical framework by distinguishing the three basic parts of the psychological process of shopping virtual items behavior: i) the motivators for chasing virtual items, ii) the reasons behind the usage of trading them so as to obtain other virtual items and iii) the factors that lead to purchase decision.

Yee (2007) examined players' motivations for buying virtual items, his primary research target was to examine the players' motivations (advancement, mechanics, relationship, competition, teamwork, customization, discovery, socializing, escapism) for taking part in massively multiplayer online role-playing games (MMORPGs). Guo and Barnes (2009) suggested that not all motivations for participating in virtual words are relevant to virtual items purchase behavior. Although, there are some common elements, only customization and advancement are important to virtual items

Yee (2005) proposed that the main reasons that lead a player to seek more and more advanced items in online games are the customization choices and the sense of achievement. These two elements were also proposed by Oh and Ryu (2007) in their research about the item-selling based payment model in Korean online games. Oh and Ryu (2007) showed that satisfaction levels increase as players use functional and decorative virtual items. Lin and Sun (2007) further clarified these two elements by categorizing virtual items in two categories: functional and decorative in their research about free-to-play multiplayer online game worlds.

Studies related to the acceptance of IS (Van der Heijden, 2004; Dahlberg, et al., 2003, Lee, et al., 2006; Moon & Kim, 2001) suggested the perceived enjoyment for examining users' IS adoption behavior. Guo & Barnes (2009) underlined the importance of functional and decorative attributes along with the perceived enjoyment but they added that there should be a link between the enjoyment of using virtual items and the participation of the players. Players must be urged to use virtual items in order to achieve their in-game goals. If players get used to combine an enjoyable gaming experience with the usage of virtual items so as to attain their goals, probabilities for purchasing virtual items are increasing.

Although, virtual items must be essential for players in order to succeed in completing in-game tasks, their usage should not be disruptive for players' efforts. Players should base their chances to achieve their in-game goals on their skills and not only at virtual items acquisition. Heijden (2004) proposed that IS acceptance models can offer instrumental or hedonic value. Attributes of Utilitarian Systems have instrumental value if they can provide information to the user so as to attain his goals, whilst IS have hedonic value if they offer enjoyment to the user by their own. Existing

research has shown that the focus has been on the utilitarian aspect of IS (Legris et al., 2003; Van der Heijden, 2004). Especially, for online games Guo and Barnes (2009) also distinguished the difference between these two values (hedonic and instrumental) and they emphasized on the importance of the instrumental attribute. According to their point of view, virtual items should be considered as tools that can offer enjoyment through participation and appropriate use and not as pleasure itself.

According to the theory of consumption values of Sheth, Newman and Gross (1991), there are five consumption values: functional, emotional, social, epistemic and conditional. Functional values refer to the functions of products. Emotional values refer to product characteristics that can trigger consumer's feelings. Social values refer to product characteristics that connect consumer with a brand. Epistemic values refer to product characteristics that increase consumer's curiosity. Conditional values refer to situational factors that induce purchase behavior. Many previous studies related to marketing, online products and e-commerce have shown that the five consumption values have an influence on PBI (Ho & Wu, 2012). However, in online games the following three consumption values are proven to affect the PBI: the functional, the emotional and the social value (Ho & Wu, 2012).

Social value derives from the social stratification of online game societies. Martineau (1958) showed that the shopping behavior is influenced by the social status. In online games the perceived social status is related to the acquisition of virtual items. Lehdonvirta (2009) proposed the social quality that virtual items may carry, as a factor that triggers the PBI. The social quality for every virtual item is related to its rarity , whilst the emotional quality refers to the customization options and the functional quality to the performance. In online persistent world games, as players want to move up the social class ladder, the social mobility should be connected with the usage of virtual items. By using virtual items and achieving their goals, players gain reputation and change their social status. The construct, Prestige, captures the influence that virtual items have on players' desire for recognition by obtaining more advanced virtual items (Lehdonvirta, 2009).

Castranova (2001) examined the virtual world Norrath and showed that users use virtual items in virtual worlds in order to gain reputation and increase their competence. He also noted that users spend a lot of money in order to make such

progress. In online persistent world games, players also spend a lot of money in order to become powerful and prestigious. The more money players spend on a specific game, the more they are locked in that game. This occurs because the switching costs are high. If players have already spent their money on one game, it is unlikely that they choose another game and start making progress from scratch. It is more likely that they keep spending their money on purchasing virtual items for the game they already play in order to maintain their status or further advancement (Guo and Barnes, 2012).

So far we have examined the factors that affect players' PBI that are mostly related to game mechanics and players' preferences. However, players' purchase options are not only depended on these factors. According to Transaction Cost Economics (TCE), transactions are also based on economic efficiency. Williamson (1981) suggested that consumers' choices about transactions are based on rationality and opportunism at some extent. Based on these attributes, previous studies related to e-shopping drivers (Foucault and Scheufelem, 2002; Cheung and Liao, 2001) proposed the transactional cost and the price as constructs in PBI model. They have shown that both constructs have a negative effect on PBI. We have to note that the concept of the transaction becomes more complex in online business and especially in virtual worlds sectors. Users in virtual worlds and players in online games can use non-purchase channels in order to acquire virtual items. Thus, the value of the virtual items have two dimensions: i) the time and the effort required to obtain them and ii) the price that they are valued at trading platforms or virtual stores (Guo & Barnes, 2009). Chen and Dubinsky (2009) examined these attributes and they developed a more abstract construct, the perceived value so as to depict the dependencies of the value of the items in e-commerce. In real world, the perceived value describes the difference between the perceived utility of the item and the perceived effort that is required in order to obtain it (Zeithaml, 1988). Particularly for virtual worlds, Guo and Barnes (2012) redefined the framework of the perceived value of virtual items. They suggested that the valuation of virtual items has different (monetary or non-monetary) weights for each player. As a result, the perceived value of virtual items depicts the players' cost benefit valuation regarding the use of virtual stores.

Previous studies (Davis, Bagozzi, and Warshaw, 1992; Venkatesh et al., 2003) noted the importance of the perceived value as a variable of the online-based PBI. Apart from perceived value they also proposed performance expectancy, effort expectancy

and social influence as variables in IS acceptance models. Guo and Barnes (2009) found that social factor is not significant while performance expectancy and effort expectancy are significant. Guo and Barnes (2012) expanded their research in a pure game centric concept and found the same results.

Methodology

Case Study method

In our research we use the case study method in order to examine the revenue streams and the results of video games business models. Generally, this method is an iterative process based on collecting data from multiple sources about specific situations (Easton, 2010; Flyvbjerg, 2006). Random data or representative situations may not be the most suitable strategy because it is unlikely that contains the amount of information we need.

On the other hand, extreme cases may contain more valuable information than representative situations because they include more basic clues and more actors. Moreover, we want to investigate the deeper causes and the effects of a problem. Random data or a great amount of representative occasions rarely produce such insight. Thus, we should pick few cases based on their validity (Flyvbjerg, 2006). According to Gibbert and Ruigrok (2010) these case studies can offer researcher the opportunity to study situations and gather information that otherwise it would be beyond his/her ability to attain. This information is not just raw data, it reveals relationships between different elements and patterns of the studied subject (Bickmand & Rog, 1998; Eisenhardt & Graebner, 2007). As a result, case study method provides a context-dependent knowledge without limiting the researcher on theoretical assumptions (Flyvbjerg, 2006).

Although the case study method enables the researcher to clarify the factors that affect a specific construct, it has its own drawbacks. First of all, case studies data consists of individual studied events. The selection of this data can be biased and the outcomes can proven to be quite subjective (Bennett & George, 2005). Moreover, while quantitative methods can be used for generalization, case studies are not considered reliable enough (Gummesson, 2006). In case studies we usually include narrative elements. Consequently, we might be able to put these narratives into a scientific formulae (Benhabib, 1990; Mitchell & Charmaz, 1996; Roth, 1989; Rouse, 1990; White, 1990 (as cited in (Flyvbjerg, 2006)).

All in all, the use of the case study method is most appropriate when we try to explain the means and the causes of a process, as well as theory omissions. It is worth to note that the experience of the actors and the exploratory nature of the research are of vital importance to have concrete and sufficient results (Baratt, Choi, & Li, 2011). Therefore, we decide to use this method to examine the factors, the process and the functions of the video games business models.

Online Survey

In order to investigate the factors that have a significant impact on players' intention to buy virtual items we opt to conduct an online survey. The online survey method has the advantages of being global, flexible, convenient, low-cost and timeless (Evans & Mathur, 2005) Moreover, online surveys enable the researcher to access unique populations that otherwise would not be possible to approach (Garton, Haythornthwaite, & Wellman, 1999; Wellman, 1997 (as cited in Wright, 2005)). Thus, it is a suitable kind of survey for a niche market such as videogames. Online surveys also decrease the time needed for data collection from these spatially disperse respondent groups (Fricker & Schonlau, 2002). The geographical distance between the interviewer and the respondent is desirable to eradicate interviewer bias and other possible problems. Specially, online surveys considered less personal than telephone surveys or other conventional surveys such as face to face (Duffy, Smith, Terhanian, & Bremer, 2005).

However, the impersonal nature of the online surveys can trigger security suspicions about data transmissions and data usage by the interviewer (Evans & Mathur, 2005). Moreover, the distance between the interviewer and the respondents may cause problems, if the questions are not clear because no guidance can be provided (Ray & Tabor, 2003). This also can happen, if the respondents lack online experience. Nonetheless, when it comes to videogames industry most players have the online experience required to answer an online questionnaire. Another problem that we must keep in mind is that the generating sample can be misleading if we have multiple answers from single users. So, it is of vital importance for the validity of the sample to reassure the uniqueness of answers (Wright, 2005).

Timelessness, flexibility and anonymity are the elements that we think as the most important for our research. So, we conclude to follow this approach to gather the information from gamers around the globe.

PLS-SEM method

In order to analyze the data from our research we followed the PLS-SEM[i] statistical method. The four pillars of a PLS-SEM multivariate analysis are: (1) the constructs, (2) the indicators (manifest variables), (3) the relationships among them and (4) the error terms. Specially, we can divide the analysis into two measurement types: (a) the exogenous latent variables (the constructs that define other constructs) and (b) the endogenous latent variables (constructs that are being clarified). The error terms express the variance when the structural models are estimated. However, not all variables are connected to error terms. Exogenous latent variables do not contain error terms whilst endogenous latent variables are connected to them (Hair et al., 2013).

The PLS-SEM method is a second-generation technique, proper for our exploratory research in contrast to Covariance-based SEM (CB-SEM). The PLS-SEM path modeling target is to clarify the relationships among the constructs whereas CB-SEM is theory testing confirmation. Moreover, when it comes to data, we should have normal distributions when we follow a CB-SEM method while PLS-SEM can handle non-normal data (Hair, Ringle, & Sarstedt, 2011). Another major advantage of PLS-SEM method over CB-SEM is that it provides statistical power and precision even with small sample sizes (Cassel, Hackl, & Westlund, 1999). However, if we have larger sample populations (N > = 250) CB-SEM and PLS-SEM outcomes are equivalent (Hair et al., 2013).

However, the PLS-SEM approach does not come without its disadvantages. The problems of this approach are the limitations that can be imposed if the researcher uses categorical data. Moreover, the PLS-SEM path modeling is not appropriate if the error terms demand supplementary specification like covariation (Hair et al., 2011).

Taking into account that the goal of this research is an exploratory view on the factors that have an influence on players' intention to buy virtual items. Thus, we conclude the degree of importance of each latent variable in the model.

The Research model

The theoretical framework that was previously discussed and survey items of Lehdonvirta (2009), Guo and Barnes (2012), Ho and Wu (2012) along with the trends[6] of the video games industry led us to the development of the research model. We developed this model (Figure 9) in order to examine the factors that have an influence on players' intention to buy virtual items. More specifically, we explored indicators from an IS (Information System) perspective as well as from a game centric approach.

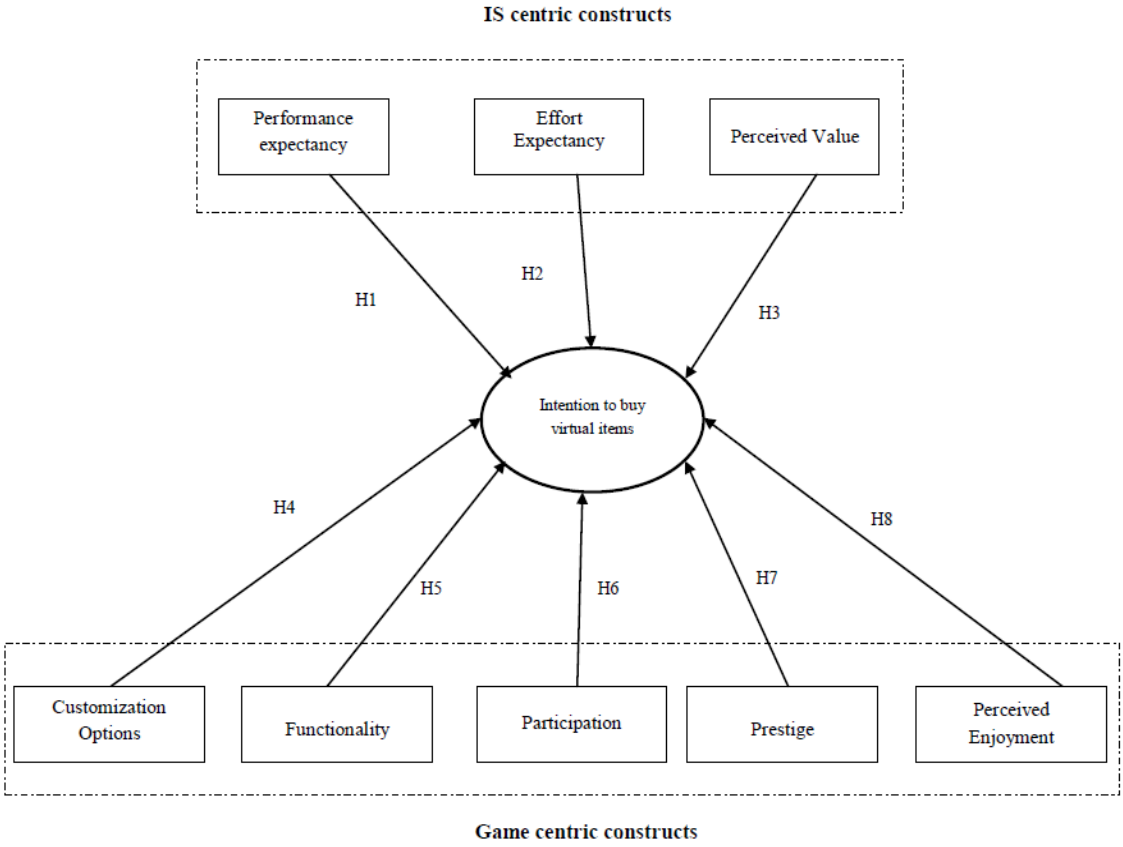

Figure 9 - The Research model

We examined IS factors related to players' purchase behavior. We chose Performance Expectancy (PE), Effort Expectancy (EE) and Perceived Value (PV) because we wanted to examine which factors of virtual stores have an influence on players' intention to buy virtual items. Performance Expectancy (PE) and Effort Expectancy (EE) play a significant role in virtual world purchase behavior (Guo & Barnes, 2012). Guo & Barnes (2012) suggested that the use of virtual stores can be

[6] i) Social networking features
ii) In-game monetization channels
iii) Cloud capabilities

considered as an acceptance of an IS. Thus, we used them to examine players'intention to buy virtual items. In order to examine the value of virtual stores' available virtual items we used the perceived value (PV). Guo & Barnes (2012) used Perceived Value (PV) in order to examine the value of available items in virtual stores taking into account the effort of finding them in non-monatery channels. Moreover we examined game factors related to players' purchase behavior According to theoretical background Customization Options (CO), Functionality (FU), Prestige (PRE), Participation (PON) and Perceived Enjoyment (PE) are significant to players' intention to buy virtual items in virtual worlds and online games. We chose Customization Options (CO), Functionality (FU), Prestige (PRE), Participation (PON) and Perceived Enjoyment (PE) because we wanted to examine the influence of decorative choices, in-game effective items, social status and participation in gaming groups on players' purchase behavioral intention. We also examined Perceived Enjoyment (PE) because we wanted to examine the effect of perceived enjoyment that players gain from playing the game and using virtual items effectively on players' intention to buy virtual items.

Performance expectancy (PE)

Performance expectancy refers to the degree that a player will choose to buy desired virtual items instead of trying to obtain them through non-monetary channels. Performance expectancy is high if a player reckons that using a virtual store would help him/her to acquire the virtual item he/she wants (Venkatesh et al., 2003; Guo & Barnes, 2012).

H1: *Performance expectancy will have a positive effect on the Intention to buy virtual items*

Effort expectancy (EE)

Effort expectancy refers to the relation between the ease of use of the virtual store and the PBI. An appropriate virtual store should have an effective user interface design as well as search and comparison options. If players can easily find and compare

virtual items, it is more likely that virtual items sales will increase (Venkatesh et al., 2003; Guo& Barnes, 2012).

H2: *Effort expectancy will have a positive effect on the Intention to buy virtual items*

Perceived Value (PV)

Perceived Value refers to the perception of the value of the virtual item that is offered in a virtual store in comparison to the resources required (time, energy, other virtual items or money) in order to obtain it. The Perceived Value is a result of the players' cost-benefit analysis for desired virtual items. If a virtual item has a high perceived value, it is probable that players will purchase it (Chen & Dubinsky, 2009; Guo & Barnes 2012).

H3: *Perceived Value will have a positive effect on the Intention to buy virtual items*

Customization options (CO)

Customization options refer to players' desire for aesthetics changes. Players can buy virtual items and modify parts of the game according to their taste. Through these aesthetic changes, a player can express himself/herself and make other players notice him/her (Lehdonvirta, 2009; Guo & Barnes, 2009; Kim, Gupta, & Koh, 2011; Ho & Wu, 2012).

H4: *Customization options will have a positive effect on the Intention to buy virtual items*

Functionality (FU)

Functionality refers to the functional quality of the virtual items and it is the most controversial value. Many players, who lack in time or skill, use functional virtual

items in order to improve their performance. If players do not use functional virtual items, they will not be able to overcome in-game difficulties (Lin & Sun, 2007; Lehdonvirta, 2009; Guo & Barnes, 2009; Kim et al., 2011; Ho & Wu, 2012).

H5: *Functionality will have a positive effect on the Intention to buy virtual items*

Participation (PON)

Participation (PON) can be defined as the social factors that lead a player to buy virtual items. Participation refers to the player who will purchase virtual items that will help him/her become a part of a group or maintain his/her place in an existing one (Hsu & Lu, 2004; Kim & Park, 2006; Okazaki, Skapa, & Grande, 2007; Lin & Sun, 2007; Guo & Barnes, 2009; Lehdonvirta, 2009; Ho & Wu, 2012, Kim et al., 2013).

H6*: Participation will have a positive effect on the Intention to buy virtual items*

Prestige (PRE)

Prestige is related to the players' desire to outstand and show off his/her social status compared to other players**.** A**s** players obtain more advanced virtual items and progress, they not only gain a functional advantage but they also climb higher up the social ladder of the virtual game community (Lin & Sun, 2007; Guo & Barnes, 2009; Lehdonvirta, 2009; Ho & Wu, 2012).

H7: *Prestige will have a positive effect on the Intention to buy virtual items*

Perceived enjoyment (PE)

The Perceived enjoyment refers to the perception of enjoyment that players gain from playing the game and using virtual items effectively. The perceived enjoyment of playing and using virtual items boosts the sales of virtual items (Moon & Kim, 2001; Dahlberg, Mallet & Oorni, 2003; Van der Heijden, 2004; Lee, Cheung, Sia, and Lim, 2006; Guo & Barnes, 2009).

H8: *Perceived enjoyment will have a positive effect on the Intention to buy virtual items*

Intention to buy virtual items (IB)

Intention to buy virtual items refers to the willingness of the players to buy virtual items in order to use them in-game. The purchase intention is an estimated probability that players' desire for certain items will be converted into an actual purchase.

Table 14 Summary of selected constructs, related causal links and support evidence.

Construct	Related causal links	Support evidence
Performance expectancy	PE + → Intention to buy virtual items	Davis, Bagozzi, and Warshaw, 1992; Venkatesh et al., 2003; Guo & Barnes, 2007,2009,2012
Effort expectancy	EE + → Intention to buy virtual items	Davis, Bagozzi, and Warshaw, 1992; Venkatesh et al., 2003, Guo and Barnes, 2007,2009,2012
Perceived Value	PV + → Intention to buy virtual items	Zeithaml, 1988; Chen and Dubinsk, 2009; Guo & Barnes 2009,2012
Customization options	CO + → Intention to buy virtual items	Lin and Sun, 2007; Lehdonvirta, 2009; Guo & Barnes, 2009; Kim et al., 2011; Ho & Wu, 2012
Functionality	FU + → Intention to buy virtual items	Lin and Sun, 2007; Lehdonvirta, 2009; Guo & Barnes, 2009; Kim et al., 2011; Ho & Wu, 2012
Participation	PON+ → Intention to buy virtual items	Hsu & Lu, 2004; Kim & Park, 2006; Okazaki, et al., 2007; Lin & Sun, 2007; Guo & Barnes, 2009; Lehdonvirta, 2009; Ho & Wu, 2012, Kim et al., 2013

Prestige	PRE + → Intention to buy virtual items	Lin & Sun, 2007; Guo & Barnes, 2009; Lehdonvirta, 2009; Ho & Wu, 2012
Perceived enjoyment	PE + → Intention to buy virtual items	Moon & Kim, 2001; Dahlberg, Mallet & Oorni, 2003; Van der Heijden, 2004; Lee et al., 2006; Guo & Barnes, 2009

Data Analysis and Interpretation of Results

We used partial least-squares (PLS) analysis to measure the results of the structural model. Our sample exceeds the minimum recommended value, which is defined by the larger of the two following guidelines: (a) 10 times larger than the number of items for the most complex construct; (b) 10 times the largest number of independent variables impacting a dependent variable (Chin, 1998). The most complex construct of our model has four items, therefore the minimum value is 40, which is much lower than our sample of 108 individuals.

Regarding the reliability and validity of the measurement model we assessed the internal consistency, convergent validity and discriminant validity (Barclay, Higgins, & Thompson, 1995; Wixon& Watson, 2001). Specifically, we measured: (1) The items' factor loadings on the corresponded constructs. Regarding factor loadings, a value higher than 0.7 is acceptable. (2) The AVE (Average Variance Extracted). AVE should be higher than 0.5 and the AVE's squared root of each variable should be larger than any correlation with every other variable (Barclay et al., 1995; Chin, 1998; Fornell & Larcker, 1981). (3) The composite reliability which should be larger than 0.7 (Agarwal & Karahanna, 2000; Compeau, Higgins, & Huff, 1999).

The structural model and hypotheses are estimated by two criteria: (1) the value of the variance measured for (R^2) by the antecedent constructs. Cohen (1988) proposed 0.2, 0.13 and 0.26 as small, medium and large variance respectively; (2) the t-values regarding path coefficients and total effects measured by using bootstrapping procedure.

The analysis regarding the measurement and structural model was conducted with the SmartPLS 2.0 (Ringle, Wende, & Will, 2005)

Measurement Model

This subsection displays the data analysis' results regarding the measurement model. Table 15 shows that all the factor loadings of the items exceed the required value. Furthermore, the values of the composite reliability, the Cronbach α and the average variance extracted regarding each variable are larger than the adequate values. In addition, Table 16 demonstrates the correlations among the variables and the AVEs which are the diagonal elements in bold. All the AVEs are higher than any other correlation; therefore the discriminant validity of the measurement model is verified.

Table 15 Results for the Measurement Model

Construct Items	Mean	Standard Deviation	Factor Loading (>0.7)[a]	Cronbach a (>0.7)[a]	Composite Reliability (>0.7)[a]	Average variance extracted (>0.5)[a]
Performance expectancy	2.83	1.02		0.94	0.96	0.89
PE1			0.95			
PE2			0.94			
PE3			0.93			
Effort Expectancy	2.40	0.96		0.82	0.89	0.74
EE1			0.83			
EE2			0.85			
EE3			0.89			
Perceived Value	3.4	0.82		0.77	0.86	0.69
PV1			0.83			
PV2			0.88			
PV3			0.77			
Customization Options	3.8	1.2		0.88	0.92	0.74
CO1			0.91			
CO2			0.92			
CO3			0.78			
Functionality	2.48	0.86		0.91	0.94	0.85
FU1			0.88			
FU2			0.94			
FU3			0.94			
Participation	2.67	0.69		0.83	0.89	0.66
PON1			0.74			
PON2			0.83			
PON3			0.85			
PON4			0.83			
Prestige	2.94	0.74		0.84	0.88	0.71
PRE1			0.82			
PRE2			0.89			
PRE3			0.87			
Perceived Enjoyment	3.94	0.84		0.89	0.90	0.73
PE1			0.85			
PE2			0.90			
PE3			0.91			

Intention to Buy Virtual Items	2.58	1.06		0.94	0.96	0.89
IB 1			0.94			
IB 2			0.96			
IB 3			0.94			

a Indicates an acceptable level of reliability and validity.

Table 16 Discriminant validity for the measurement model

Discriminant validity for the measurement model									
Construct	PE	EE	PV	FU	CO	PON	PRE	PE	IB
PE	**0.95**								
EE	0.58	**0.86**							
PV	0.27	0.26	**0.83**						
FU	0.30	0.26	0.43	**0.86**					
CO	0.61	0.55	0.23	0.31	**0.92**				
PON	0.67	0.52	0.23	0.36	0.54	**0.82**			
PRE	0.44	0.55	0.52	0.62	0.55	0.48	**0.84**		
PE	0.48	0.41	0.33	0.28	0.32	0.55	0.52	**0.85**	
IB	0.73	0.58	0.22	0.28	0.62	0.67	0.60	0.55	**0.95**

Bold values: the square root of the average variance extracted (AVE) of each construct.

Structural Model

The Structural model was examined through the statistical significance of path coefficients, total effects and R^2 values. T-values regarding path coefficients and total effects were measured through a bootstrap procedure with 1000 resamples. Table 17 and figure 10 summarize the results regarding the hypotheses.

Table 17 Hypothesis testing results

Hypothesis testing results				
Hypothesis	Path	Path coefficient	t value	Results
H1	PE-> IB	0.38**	7.68	support
H2	EE-> IB	0.26**	6.83	support

H3	PV-> IB	0.23**	3.09	support
H4	CO-> IB	0.53**	13.8	support
H5	FU -> IB	0.29**	6.83	support
H6	PON -> IB	0.11*	0.75	Marginally support
H7	PRE -> IB	0.18**	3.55	Support
H8	PE -> IB	0.17*	1.83	Marginally support

*** p<0.1, **p < 0.01.**

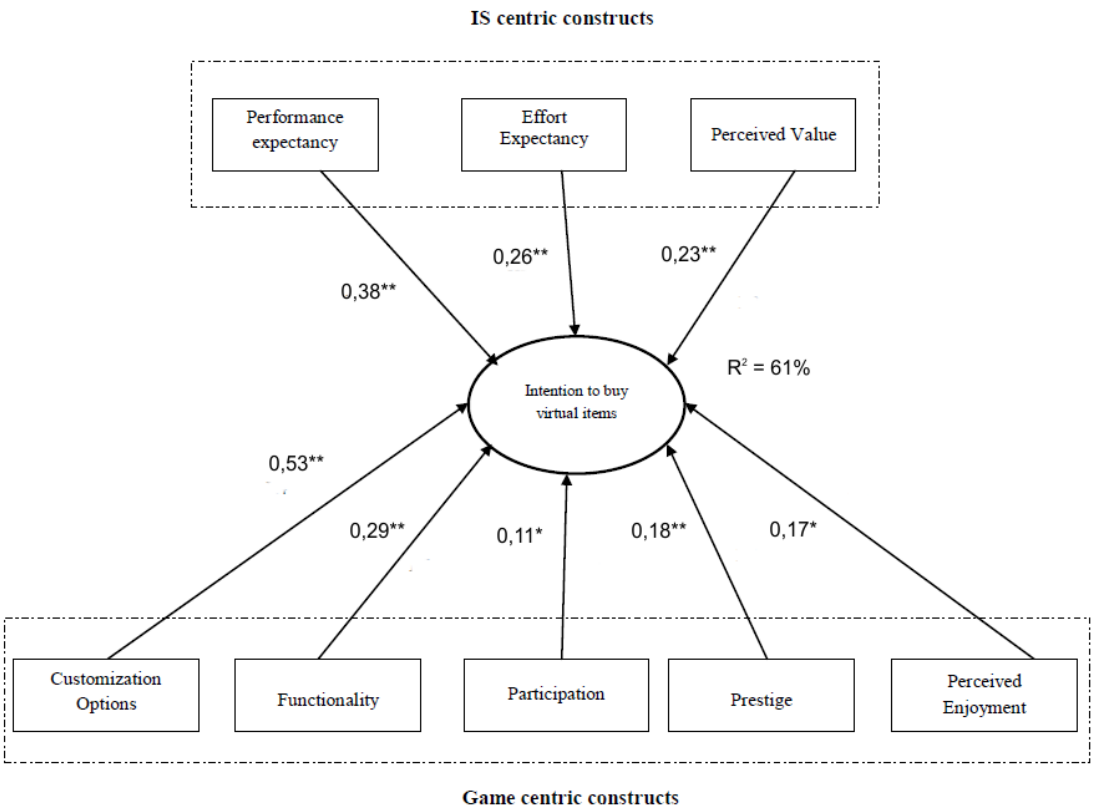

Figure 10 Path coefficients of the research model

Results

The $R^2 = 61\%$ is an indicator which shows how "successful" is our regression. It specific means how effective is the explanation of independent variables on the dependent variables. In our case we have panel data which means we are satisfied if the R^2 is above 30%.

Intention to buy virtual items was influenced positive by Performance Expectancy (0.38) and it is high statistically significant (t=3.55>t_c=2,6).

Intention to buy virtual items was influenced positive by Effort Expectancy (0.26) and it is high statistically significant (t=6.83>t_c=2.6).

Intention to buy virtual items was influenced positive by Perceived Value (0.23) and it is high statistically significant (t=3.09>t_c=2.6).

Intention to buy virtual items was influenced positive by Customization options (0.53) and it is high statistically significant (t=13.8>t_c=2.6).

Intention to buy virtual items was influenced positive by Functionality (0.29) and it is high statistically significant (t=6.83>t_c=2.6).

Intention to buy virtual items was influenced positive by Prestige (0.18) and it is high statistically significant (t=3.55>t_c=2.6).

Intention to buy virtual items was influenced positive by Participation (0.11) and it is marginal statistically significant because the confidence interval is 90%.

Intention to buy virtual items was influenced positive by Perceived Enjoyment (0.17) and it is marginal statistically significant because the confidence interval is 90%.

Thus, PE (0,38), EE (0,26), PV (0,23), CO (0,53), FU (0,29), PRE (0,18) are the most important constructs of our model. We have to note that the IS –centric construct Performance Expectancy (PE) (0,38) and the Game-centric construct Customization options (CO) (0,53) have the strongest effect on players' purchase behavior. Additionally, the Game-centric construct Prestige (PRE) (0,18) and the IS –centric construct Perceived Value (PV) (0,23) have the lowest impact. While, customization options (CO) (0,53) has the strongest effect and Prestige (PRE) (0,18) the lowest impact on players' purchase behavior.

According, to our survey items, players are more likely to spend their money on aesthetics and in-game effective virtual items, rather than on virtual items that are pertinent to their relationships with other players. Moreover, in contrast to Game-centric constructs, all IS-centric constructs have a strong influence on players' purchase intentions. Game mechanics should adapt to and emphasize on promoting in-game virtual items that offer the player customization options and in-game effectiveness. Virtual stores should help player to find his/her desired virtual items and search process should be easy. Moreover, virtual stores should offer virtual items with high perceived value.

Last but not least, we have to underline the limitations of our model. This model does not include any indirect effects that may exist. We do not take into account other possible virtual item drivers such as cultural references or provenance (Lehdonvirta, 2009) because we focus more on Game-centric and IS-centric constructs. We do not examine the habit as a possible virtual item driver because habit has an effect on the actual purchase behavior and not on intention (Guo & Barnes 2009). We do not take into account constructs related to intention to play online games such as flow or critical mass (Hsu and Lu, 2004). We do not include Price Utility (PU) because Price Utility refers only to monetary value of virtual items. We prefer Perceived Value to Price Utility because Perceived Value includes both monetary and non monetary value of the virtual items available at virtual stores. Moreover, this is a generic model, without having any possible modifiers such as game type (Ho & Wu, 2012).

Implications

Previous studies (Guo and Barnes, 2012) also found that Performance Expectancy (PE), Effort Expectancy (EE), Customization Options (CO), Prestige (PRE), Perceived Enjoyment (PE) and Perceived Value (PV) have a positive effect. However, Guo and Barnes (2012) found that Participation (PON) does not affect positively players' purchase behavior. Ho and Wu (2012) found that indeed, Participation (PON) affects players' intention to buy virtual items. Ho and Wu (2012) also found that Customization Options (CO) and Prestige (PRE) affect positively players' purchase behavior. On the other hand, we have different results with Ho and Wu (2012) because Ho and Wu (2012) found that Functionality (FU) does not affect positively players' purchase behavior.

Moreover, Guo and Barnes (2012) found that Perceived Value (PV) has the strongest effect on players' purchase behavior. On the other hand we found that Perceived Value (PV) has the least strong impact on players' purchase behavior. Ho and Wu (2012) found that Price Utility (PU) has the strongest effect. We agree with Guo and Barnes (2012) and Ho and Wu (2012) that Prestige (PRE) has the least strong impact on players' purchase behavior. We also have to note that both Guo and Barnes (2012) and Ho and Wu (2012) found that Customization options (CO) has the second most strong effect. In our research we found that Customization options (CO) has the strongest effect on players' purchase behavior.

The results of our survey may be useful to video game companies that follow business models that include virtual items transactions in their revenue streams and third-party enterprises such as game-tournament organizers.

Video game companies that follow these business models and have their own virtual store may take into account the strong effects of IS-centric constructs (Performance Expectancy (PE), Effort Expectancy (EE), Perceived Value (PV) in order to enhance their virtual stores' efficiency. Most players should find their desired virtual items in virtual stores. Virtual stores should also have comparison tools and advanced search capabilities in order to help players in their search. Moreover, virtual stores

should offer virtual items with high perceived value according to game audience attributes. For example, a virtual store offers virtual items with high perceived value, if the only other way players can obtain them is by waiting and most players do not have time to wait. If video game enterprises have to focus on only one construct, they should focus on Performance Expectancy (PE). As a result they should focus on helping players find their desired virtual items in virtual stores.

Moreover, video game companies may take into account the effects of Game-centric constructs (Customization Options (CO), Functionality (FU), Prestige (PRE)). Our results may help them to set game design priorities. In order to create virtual items with high selling value, video game companies should take into the most strong effects, Customization Options (CO) and Functionality (FU). As a result, video game companies should focus offering virtual items related to in-game effectiveness and customization options. For example, a video game company can focus on offering damage proof items, costumes or background themes. If video game enterprises have to focus on only one construct, they should focus on Customization Options (CO). Hence, they should focus on offering virtual items related to alternative aesthetic changes.

More specifically, video game companies that follow user generated content model should promote more the creation of virtual items related to in-game effectiveness and customization options. Players that take part in this business model may also find our results useful in their trade with other players or the video game company which holds the rights of the game.

What is more video game enterprises can offer virtual items related to Prestige (PRE). Such virtual items may show off player's progress or status. For example, in videogames betting models such virtual items are virtual special badges that depict players' consecutive wins.

Video game enterprises that follow the crowdfunding model can use our results in order to charge for early access to virtual items related to aesthetic changes, in-game effectiveness and social recognition in order to get funded more quickly.

Our results can also be useful to video game companies that follow the donationware model. Video game companies can offer virtual items that are game effective and have social impact. For instance, players can donate some money and get

virtual medical health packs in exchange in order to help other players that face difficulties during a virtual natural disaster. Charity organization can use some of donations in order to have a real social impact.

Video game companies may also offer virtual items related, to Participation (PON), if there are strong social bonds in the communities of a video game. For example, such virtual items are special rings that allow player to communicate with his/her gaming group but only if they hold the same type. However, we have to note that Participation (PON) and Perceived Enjoyment (PE) require further research.

Even if the factors of players' purchase behavior change from time to time, it's difficult to change game mechanics or business model aspects from one day to another without affecting in-game balance. The success of adaptation lies in the balance between the value for the players and the revenue for the video game companies.

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Appendix

Questionnaire

Gender

○ Male ○ Female

Age

Age

Favorite video game genre

Video game genres

How often (approximately) do you currently play video games?

○ Every day ○ Weekly ○ Once a month ○ Once in 6 months ○ Less than once a year

Please check the circle a score from the scale 1 (strongly disagree), 2 (Disagree), 3 (Neither agree nor disagree) to 4(Agree), 5 (strongly agree).

Performance expectancy (PE)

1. **Virtual goods sold in virtual stores are rare compared to the chances of finding them in game.**

○ 1 ○ 2 ○ 3 ○ 4 ○ 5

2. **I find mostly all desired virtual goods in virtual stores and i don't need to search for them in trading platforms.**

○ 1 ○ 2 ○ 3 ○ 4 ○ 5

3. **Virtual goods sold in virtual stores help me to save time in order to obtain other desired items.**

○ 1 ○ 2 ○ 3 ○ 4 ○ 5

Effort expectancy (EE)

4. **I can navigate and easily find my desired items in virtual stores.**

○ 1 ○ 2 ○ 3 ○ 4 ○ 5

5. **Virtual stores have payment procedures that are easy to understand.**

○ 1 ○ 2 ○ 3 ○ 4 ○ 5

6. **Virtual stores have comparison tools and advanced search capabilities.**

○ 1 ○ 2 ○ 3 ○ 4 ○ 5

Perceived Value (PV)

7. **Virtual goods sold in virtual stores should be useful and reliable.**

○ 1 ○ 2 ○ 3 ○ 4 ○ 5

8. **Virtual goods sold in virtual stores have the same or better quality compared to virtual items i can find in-game.**

○ 1 ○ 2 ○ 3 ○ 4 ○ 5

9. **Virtual goods sold in virtual stores should be value for money.**

○ 1 ○ 2 ○ 3 ○ 4 ○ 5

Customization Options (CO)

10. **Using virtual items sold in virtual stores are important for me to personalize game features(characters, backgrounds or environments etc).**

○ 1 ○ 2 ○ 3 ○ 4 ○ 5

11. **Using virtual items sold in virtual stores are aesthetically fashionable.**

○ 1 ○ 2 ○ 3 ○ 4 ○ 5

12. **Using virtual items sold in virtual stores help me look different than other players.**

○ 1 ○ 2 ○ 3 ○ 4 ○ 5

Functionality (FU)

13. **Using virtual items sold in virtual stores make me more effective in accomplishing game tasks.**

○ 1 ○ 2 ○ 3 ○ 4 ○ 5

14. **Using virtual items sold in virtual stores help me to progress more quickly.**

○ 1 ○ 2 ○ 3 ○ 4 ○ 5

15. **Using virtual items sold in virtual stores are of satisfactory quality.**

○ 1 ○ 2 ○ 3 ○ 4 ○ 5

Participation (PON)

16. **Using virtual items sold in virtual stores help me make new friends.**

○ 1 ○ 2 ○ 3 ○ 4 ○ 5

17. **Using virtual items sold in virtual stores help me enter clans or other gaming groups.**

○ 1 ○ 2 ○ 3 ○ 4 ○ 5

18. **Using virtual items sold in virtual stores help me retain my social relationships.**

○ 1 ○ 2 ○ 3 ○ 4 ○ 5

Prestige (PRE)

19. Using virtual items sold in virtual stores can help me show off my social status.

○ 1 ○ 2 ○ 3 ○ 4 ○ 5

20. Using virtual items sold in virtual stores can help me show off my progress to others.

○ 1 ○ 2 ○ 3 ○ 4 ○ 5

21. Using virtual items sold in virtual stores can help me enhance the point of view that other players have about me.

○ 1 ○ 2 ○ 3 ○ 4 ○ 5

Perceived Enjoyment (PE)

22. Using virtual items sold in virtual stores is a pleasant experience.

○ 1 ○ 2 ○ 3 ○ 4 ○ 5

23. Using virtual items sold in virtual stores satisfy my curiosity.

○ 1 ○ 2 ○ 3 ○ 4 ○ 5

24. Using virtual items sold in virtual stores contribute to keep me immersed in game.

○ 1 ○ 2 ○ 3 ○ 4 ○ 5

Intention to buy virtual items (IB)

25. I …….with the idea of purchasing virtual items in video games.

○ 1 ○ 2 ○ 3 ○ 4 ○ 5

26. My willingness to buy virtual items is high.

○ 1 ○ 2 ○ 3 ○ 4 ○ 5

27. The chances to buy virtual items in my next games that offer virtual items are high.

○ 1 ○ 2 ○ 3 ○ 4 ○ 5