

Paid and Free Digital Business Models Innovations in the Video Game Industry

Myriam DAVIDOVICI-NORA

Institut Mines-Telecom/Telecom-ParisTech, Paris, France

Abstract: Digitalization of distribution has led to the creation of a broad range of digital business models in the video game industry among them freemium, subscription, advertisement, free-to-play. What are the borders of each model and on what economic grounds can we compare them? This paper proposes an interdisciplinary approach based on microeconomics and on business models literature to provide insights into the components and the economic architecture in paid and free business models. This framework enables also to understand recent hybrid paid and free business models in the video game industry.

Key words: free-to-play, pay-to-play, video games, business model, innovation.

From \$10 billion in 2006, the video game industry is today the dominant entertainment industry reaching \$66 billion worldwide in 2013 before other entertainment industries. A substantial part of this growth comes from the democratization of gaming today thanks to new technologies, innovations in game designs and new business models. 135m people play at least one hour per month. Most of these new gamers are casual gamers and have been attracted to the gaming world by social or free-to-play games (MACCHIARELLA, 2012). In the US, 70% of PC gamers play casual games, and 50% play casual social games in 2010. Interestingly enough, casual online games appeal to all segments, including hardcore PC gamers (McKINSEY, 2011). The industry had nevertheless to adapt to digital distribution, though certainly before other cultural industries. Digital distribution fosters also new clusters of services around the game and cross-platforms gaming (mobile devices, PC, console) and gave birth to a broad range of pricing and contents, among them advertisement, freemium, subscription or free-to-Play (F2P) model (about 50% of current iOS games are F2P). How can we compare these models? We need to think about the scope of each model, its economic architecture and its values to clarify the landscape of digital business models today. This should help developers to choose the most relevant business model and other cultural industries to find

a source of inspiration to adapt their business model. However, today there is too little economic theoretical underpinning in the literature of digital business models applied to the video game industry ¹. The aim of this paper is to apply economic thinking to the main "models" of digital business models to find a generic way to make their process and their values explicit to fill this gap.

■ Literature on digital business models innovation in the video game industry

Based on MAGRETTA (2002), CHESBROUGH (2010), YANNAPOULOS (2013) and EL SAWY & PEREIRA (2013), it is acknowledged that a business model is concerned with value creation for the consumer and the producer, the revenue model and the key processes and resources to deliver value.

Importantly, EL SAWY & PEREIRA (2013) say that though the literature focused progressively on the design of business models for services provided through digital platforms, some research still remains to understand these new models. The comparison among digital business models relies on three main components (See WEILL & WORNER, 2013, pp. 74-75): content (what is consumed?), customer experience (how it is packaged? including tools, recommendations, business processes, interface) and platform (how it is delivered?, partner, proprietary/public networks; types of platforms = external platform like mobile devices, computer or internal platform like customer data, customer analytics, human resource, finance, ...).

The evolution of business models is necessary to adapt to a changing environment and competition or to exploit a new source of values (YANNOPOULOS, 2013). In the competitive environment, developers must indeed pay more and more attention to their players' base satisfaction and digitalization is seen as a new way to innovate in service customization. The literature supports also the use of experimentation or gradual changes in the process of business model innovation (CHESBROUGH, 2010).

¹ In this paper, we use the term video game to cover all games whatever the platforms (computer, mobile and console).

How does this theoretical framework apply to the video game industry? Here is a list of the main digital business models found in the literature (OLSSON & SIDENBLOM, 2010; VAN DREUNEN, 2011; MOREL, 2012, BEHRMANN 2012, MACCHIARELLA 2012, VANHATUPA 2013, CECI 2014): digital distribution, subscription, virtual goods, Free-to-Play, Free and advertising, freemium, crowdfunding, early access, premium unit price, hybrid, player to player trading. F2P model is often confused with freemium model. In F2P games, the basic game is free and the players can buy optional virtual items and services to enhance the quality of the basic game experience. It is also called "microtransactions model". The range of virtual goods can cover all parts of game service and are available in a dedicated in-game shop for a price range between \$1 and sometimes thousands of dollars ².

However, the literature does not provide an in-depth economic analysis to make comparisons possible and to assess the respective strengths and weaknesses of each business model. We propose to construct a map of business models and their main components and values from players' and developers' points of view to clarify their underlying processes.

■ Innovations in the business model economic architecture: P2P vs. F2P models

We analyze here the building blocks of the two main digital business models available on all gaming platforms. We focus on consumers and producers' rationalities.

P2P business models have a simple and linear economic architecture: Development-Monetization-Acquisition-Retention (D-M-A-R)

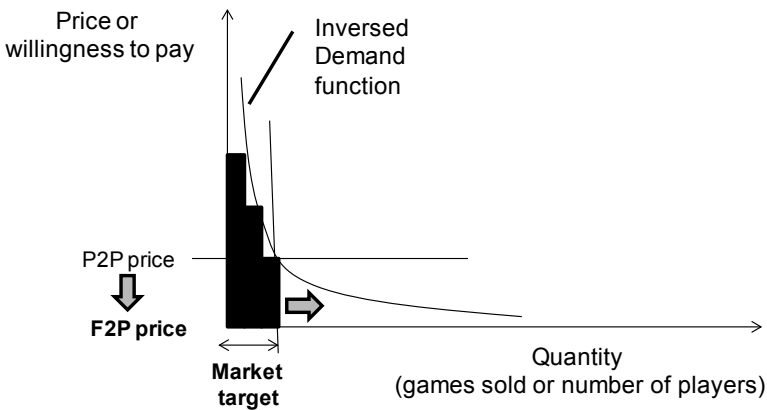
P2P architecture consists in three stages from the point of view of the consumer: Monetization (the player first buys the game), Acquisition (the player discovers the gameplay) and Retention (the player enjoys the game

² In the game *Dark Orbit* (Bigpoint), a rare item (the Zeus Drone) was sold at about €1000 (CRAWLEY 2011). See DAVIDOVICI-NORA (2013a) for a typology of virtual goods available in F2P games.

and repeats gaming)³. Retention is at the end of the process and is independent from the monetization stage. Once the price is sunk, the quality is tested and the player is more or less retained. The content is said to be sold on a premium basis which means that for a unique price, the player has access to a unique and all encompassing service. Retention must be strong enough to motivate the player to wait for the next sequel of the game.

With the P2P model, the traditional producer's economic behavior consists first in building the collective demand for the game. In the traditional economic approach, the consumer's behavior is figured out by the demand (or consumption) function. For one consumer, it indicates that he buys less quantity of the item with the increase in the item's price. At the market level, the collective demand indicates how many consumers (or players) are willing to pay a certain price level to acquire one unit of the item. The average market price is governed by competitive advantages and competitor pricing. The P2P developer then makes the following economic calculus: (production and marketing costs + margin)/average market price = profitable market target size. There is a balance between the unique market price level, the demand for that price and production and marketing expenses.

Figure 1 - P2P and F2P consumption functions



Source: DAVIDOVICI-NORA (2013b)

³ Retention and addiction concepts are very similar to the game designer's view. Retention means that the game has enough elements of attraction to make it popular and to increase the player's replay value under the constraint of staying fun for the player (e.g. if addictive elements, grinding tasks, are too emphasized, they alter the experience and reduce the overall enjoyment of the game). Compared with slot machines, HARRIGAN *et al.* (2010) put forward that retention is not based on winning real money but more on skills.

Consumers with willingness-to-pay higher or equal to the P2P price will buy the game (in Figure 1 above, three consumers are willing to buy the P2P game at P2P price) and the others are not. In the P2P model, there is a unit-price scheme satisfying a limited quantity of consumers in the market (the market target).

F2P business models have a complex and interactive economic architecture: A-R-M-D

Since the monetization stage has been pushed to the end of the process, it is now optional to pay. It happens when the player has a certain experience of the game (engaged players) and hence profitability is less certain. The architecture of the F2P business model is more complex, for it generates multiple interactions among components and not only a one-to-one relationship (as in the linear P2P architecture). We will explain the underlying economic reasons.

The behavior of consumers playing a F2P game

The objective of F2P business model is to put emphasis on experience before monetizing it. Since the game is free, the acquisition stage looks like an easy and automatic stage: players enter freely and generate network externalities on other players in acquisition and retention stages (viral marketing, popularity and quality signal). Free is a means to accumulate a huge user base (that is why this model has been first adopted mainly by social games that required maximum friends to play with). If the player is addicted to the game, he is locked in and will not quit the game. Based on the theory of engagement, the longer a user plays, the more chances he buys virtual items. In this analytical context, the F2P business model looks easy to manage: the developer must fix the price to zero and sell digital items. However, notably based on an empirical observation of few successful financial switches from P2P to F2P business model ⁴, the reality

⁴ Notable exceptions are *Anarchy Online* (sci-fi MMO by Funcom), *Counter-Strike Online* (MMOFPS by Valve and Nexon), *Team Fortress 2* (RTS by Valve) and *FIFA14 App* (Football game by Electronic Arts). *Anarchy Online*, released in 2001 gradually became a hybrid F2P game based on advertising and subscription. The game faced technical problems upon its release (including problems of stability, registration and billing), and therefore earned a bad reputation. In 2002, a free trial for a limited period of days was introduced, in an effort to build a bigger subscribers base. The popularity of the game declined in 2008 after reaching a peak of two million subscribers ("Funcom celebrates 7 years of Anarchy Online" (2008/07/01),

seems that succeeding with a F2P business model looks more complex. Indeed, F2P games have a specific design as J. Allen Brack, production director of *World of Warcraft* reminds us:

"We didn't make the game to be free-to-play...We would have to rework the game pretty significantly in order to make it free-to-play. It's not something we're currently considering" ⁵.

From the producer's point of view, the F2P model should embrace the whole market (the long tail) (see arrows in Figure 2) since its price is zero. This attractive unlimited collective demand for the game cannot be monetized at this stage. The first economic problem is that with no entry fee, profitability is based only on performances of items sales. In other words, F2P games developers cannot use collective demand (total number of players of the game per unit of time) to assess profitability but rather they must use the individual micro-demand for each item. The second difficulty is that these individual micro-demands are contextual: there is no absolute price-elasticity but variable price-elasticities depending on the level, gaming profile, constraints, etc. faced by the player. It is not possible to give objective value to each item. Items will then be priced subjectively between one dollar and a thousand dollars with marketing threshold (price points). This is all the more prevalent that digital items are pure public goods: they are non-rival and non-excludable and they cost almost nothing to produce.

Economic theory adds also that players will get a greater willingness to pay for virtual items if items are tailored to their individual preferences. Since individual preferences are changing while playing, the F2P game developer must offer a wide variety of differentiated items to potentially satisfy all changing and diversified individual preferences to capture the maximal consumer's surplus. However, contrary to HAMARI (2009), there is no perfect discrimination in F2P as defined in microeconomic theory because each item has the same unit-price for every player.

Consequently, the F2P developer must consider the game as market with dynamic consumption and production functions where price is no longer the main driver of equilibrium: the economics of "contextual" micro-transactions

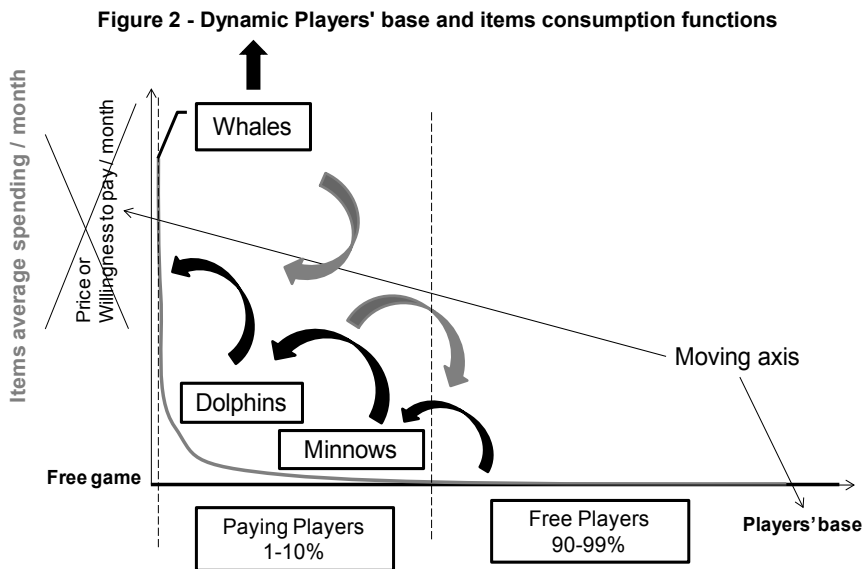
<http://www.funcom.com> (2014/01/21). *Team Fortress 2* released in 2007 became a F2P in 2011 where players can sell items they created and revenues are shared with Valve. In 2013, Valve paid out over \$10m to users who created contents (ROWLINGS 2014). In 2013, EA launched a very successful F2P version of *FIFA 14* for iOS and Android ("FIFA 14: un succès énorme pour la version Free to play", (2013/11/12), <http://www.jeuxactu.com>).

⁵ Source: www.eurogamer.net (2013/11/09).

governs the F2P model. These economic conditions are the main reason why the F2P developer runs the "game market" and the e-shop with specific metrics based on real-time data management ⁶ (choice of items, types of items purchased, etc.).

Dynamic players' base and changing consumers' preferences

In the absence of a collective demand function for the F2P game (Monthly Average Users can actually be a good proxy of the potential maximal market share), the only economic variable available is the individual micro-demand per item. On Figure 2, we represent the global average spending per month for different consumption profiles of players. Aggregate data are useful only to assess profitability of the game. Individual micro-demands for each item are obtained with items on the horizontal axis and real spending on the vertical axis.



Source: DAVIDOVICI-NORA (2013b)

LOVELL (2011) qualifies small, medium and high paying players respectively as minnows, dolphins and whales. When the access to the basic gaming experience is free, all potential or acquired players are first

⁶ See DAVIDOVICI-NORA (2013a) for metrics tables and definitions.

free players. The strategic objective is to make the game profitable firstly by switching some players from the majority of free players to the minority group of paying players (becoming minnows) and secondly by inducing paying players to pay more (becoming dolphins and whales)⁷. On Figure 2, this strategy is represented by black arrows. It may seem counter-intuitive that the optimization of monetization does not take into account the maximization of the players' base. The main indicator remains indeed the global profitability but it can be reached with a large base of whales (but seldom) or also with a very large base of small paying players or with a small base of large paying players.

Based on personal gaming experiences, the segmentation is not as simple anyway: the size of players' base and the average spending of players change with time and with play. Some players keep on the same consumption profiles while others can be repeated minnows (becoming dolphins) one month, free players the next month (grey arrows in Figure 2). These dynamics are due to changing willingness-to-pay over time, depending on the game genre, on the exact moment of playing, on the environment, on the constraints of the gameplay and on the price of the item and its value for the F2P player.

Because players don't pay to get the game but to improve their gaming experiences, even inside a same profile, there are individual variations: a paying player can be a dolphin because he buys one more expensive item or many repetitive cheap items. It turns out that the items micro-demands are not constant functions. It becomes complicated to make an easy and trivial relationship among fun, experience and monetization under these conditions. F2P requires a dynamic micro-management of each player and of its gaming experience. Items are used to differentiate the individual experience of players and to capture a consumer's surplus based on the contextual value of the item in relation to the gameplay. All the difficulty consists now in managing the monetization stage of the F2P and to coordinate it with other stages.

We propose to examine the working of each stage to focus on their cross-relationships⁸.

⁷ According to MACCHIARELLA (2012), most titles monetize only 5-10% of their active player base.

⁸ For further details, see DAVIDOVICI-NORA (2013b).

Acquisition is not obvious

Free means there is no barrier to entry to test the game. However, because of competition among free models (free iOS app of the day, freemium, diffusion of F2P), free is not enough to reach visibility. To acquire players, the developer must sink more and more expensive marketing cost (including ad campaigns) and induce viral user acquisition (wall posts, notifications, etc.). The risk is that many new players massively test the game and get committed but without enough paying players among them. Growth of players' base and monetization must be concomitant otherwise costs (maintenance, server, marketing) to manage the base will quickly exceed revenues. Only 2-6% of F2P players pay whereas the average cost per user in the US is over \$1.50 for iPhone (MOREL 2012).

Retention is volatile

The player is addicted to the game (the replay value) but is not yet financially committed. It is necessary to emphasize emotional commitment through narrative techniques, customization, quality of gameplay and different push marketing techniques to stay connected to players (assiduity rewards, regular new contents) and to use analytics to manage engagement. To convert free committed players into paying players, they must have incentive to pay and not consider paying as a constraint to level up but rather as a means to increase the fun of its experience. Emotional investment will translate into financial investment if the player considers it to be necessary (FREEMAN, 2011). However, it is easy to damage retention and make players quit the game because of any slight in-game change (STUART, 2011) or because the monetization pressure is too intrusive and breaks immersion (OLSON & SIDENBLOM, 2010). To maximize engagement, it is necessary to make the game fun for free and paying, high and low levels players. A bad retention increases acquisition costs and decreases monetization. Happy engaged players will increase viral acquisition.

Monetization is complex

One of the main astonishing paradoxes of F2P model is that the game can be a hit without being profitable (which is impossible with a paid model). Profitability depends indeed on the number of paying players and how much they spend independently of the size of the base. In turn, this depends on the management of monetization (running e-shops with events and sales, the choice and value of items, and balancing paying vs. free items) and the

contextual marketing of items (right place, right price, right time, right player) with its inherent risk of deterring addicted players.

No entry cost combined with long tail reaching means that minnows and free players who form the big majority of players must be convinced to pay for micro-transactions. It is necessary to get the psychology and the frustrations balances right to make the player purchase based on his perception of value (DAVIDOVICI-NORA, 2013a). Incentives to pay are connected to utility of items in the game (to level up, to increase time to play or number of lives, to team play)⁹. To make free players pay, room still remains for innovating in new means of monetization targeted to players' playing profiles other than those existing today. The average spending amount is nevertheless not correlated to the purchase power of players: if the player of a puzzle game has a "champion profile", his objective is to level up as high as possible without paying. He is not sensitive to waiting time or in other words less impatient (he can replay the same level without paying as long as he thinks it is feasible to him). LU (2014) confirms that whales' players are not a demographic target but can be anyone. The focus should therefore rather be on the quality of games for all players' profiles. As long as value to the player exceeds the cost, he buys items. According to LU (2014), the player is even more likely to become a dolphin or a whale if the items have a long-term value to him.

A well-managed monetization has a positive impact on retention. Creating new items, offering paying items freely or making possible craftware of items by players¹⁰ are some means to increase monetization or virality¹¹ and finally to improve player's satisfaction¹². If monetization strategy does not fit the gameplay or if the e-shop is badly managed, an engaged player willing to pay will not be induced to pay for virtual items.

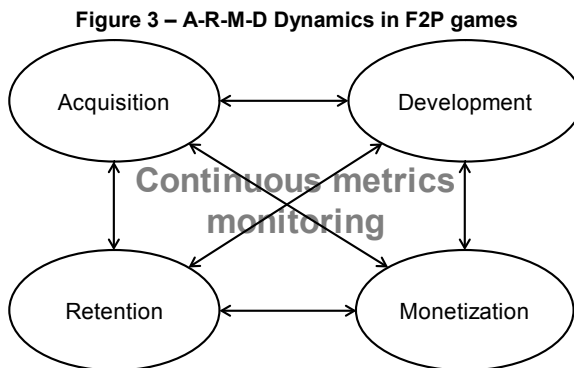
⁹ The subjective pricing of digital items accounts also for incentives to purchase or not: see the \$174.99 Halloween package in *Team Fortress 2* (Valve).

¹⁰ Items created by players are sold in the e-shop and the revenues are shared between player and developer (often with a tax system).

¹¹ According to STUART (2011), *Bejeweled Blitz* (PopCap) increased engagement by increasing the frequency of players receiving special gems because they were most likely to share the gems with their friends than any other things.

¹² For example, if to monetize, the player must kill a dragon and if 90% of players failed to kill the dragon, the dragon becomes a bottleneck to monetization. The developer must not remove it or make it easier but can deliver in-game messages or hints, challenges and free goods to keep the players engaged (STUART, 2011).

The performance of the global A-R-M process depends on the management of the relationships inside A-R-M loops but also on its relationship to development/design (D) of the game. F2P success means managing the complexity of interdependent A-R-M-D dynamics and monitoring every player (Figure 3). The developer must understand precisely the gaming profile of each player and must segment on a real-time basis its players' base appropriately. Since the company can record transactions and integrate analytics, it understands more accurately the in-game economy and makes informed real-time game design changes to increase global performances of A-R-M-D. The developer has access to continuous learning and can identify behavior patterns with metrics. STUART (2011) calls it the "funnel analysis". As in the literature on business model innovations, the developer also runs simulations to test the impacts of new contents on the global balance of the gameplay¹³. The F2P design implies unlimited development (the game has no end) as long as the game is profitable: the free core experience and the paid optional components evolve together.



Source: The author

¹³ Both *Clash of Clans* and *Hay Day* are updated every few weeks with new content (items, in-app purchases, characters). To keep *Clash of Clans* balanced, Supercell runs an automated testing simulation that runs thousands of battles one after the other, throwing in randomly sized armies with different soldier types each time, and then correlates the data to see whether there are bad balances that could potentially ruin the game (ROSE, 2013).

■ Values of paid and free business models: P2P vs. F2P

Based on the economic process inside architectures of P2P and F2P business models, we propose to list their economic values from the consumer's and producer's points of view. To put forward the specific values of each model or its DNA, we first propose to list the common values of paid and free models based on empirical observations:

- All digital models can be adapted to games' sizes and genres. Contrary to LEE (2013), F2P is not limited to casual and short games (e.g., F2P MOBA *League of Legends*, RTS *World of Tanks*, RTS *Team Fortress 2*, FPS *Hawken*, CSR *Racing*, RTS *Clash of Clans*, MMORPG *Maple Story*).
- Size or complexity of the game impacts on development time and does not depend on the choice of digital model: from 1 year (for F2P RTS *Clash of Clans* Apps, Supercell) to about 6 years (F2P MMORPG *Maple Story* 2's development started in 2009 and the beta version is planned for 2014) ¹⁴.
- Free testing is not only a F2P feature: All hybrid P2P models have a free period/demo version to test the game (contrary to LEE 2013).
- Customization options are not larger in F2P than in P2P: Players can always customize their experience with more or less choices but in P2P they are all included in the price.
- Balancing virtual worlds and items is a specific issue to all multiplayer online games and not only to F2P games.
- Paid and free business models require a combination of community building and branding strategy to keep players engaged and to enlarge audience.
- In paid and free business models new regular contents/levels/items are created by developers or players to extend the lifespan of the game (e.g., Blizzard, King, Rovio developers).

Now, we can apply the theoretical components of digital business models (see the first part of this paper) to shed light on the remaining values that are the most discriminant for developers (D) and players (P) in paid and free business models :

¹⁴ Sources: "MapleStory2 Development Officially Confirmed by Nexon" (2009/07/12) and "MapleStory2 Debuts, Beta Test Coming Next Year" (2013/11/06) from <http://news.mmosite.com>

-
- Revenues timing (D): discrete for P2P (mainly in the first months after release) vs continuously for F2P (less seasonal)
 - Revenues amount (D): limited for P2P (price of the game) vs. unlimited for F2P (unlimited purchasing)
 - Profitability risk (D): higher before the distribution in P2P vs. higher after the distribution in F2P.
 - Content management (D): outside the game in P2P vs. inside the game in F2P.
 - Innovation/development process (D): discrete and slow for P2P vs. continuous and reactive for F2P
 - Player's experience (P): possibility to speed up leveling by playing in P2P vs. paying in F2P
 - Consumer risk (P): value of the game in P2P vs. controlling amounts spent in the e-shop in the F2P
 - Playing with real friends (P): limited to some friends in P2P vs easier with any friends in F2P (no financial barrier to entry).

We agree with STUART (2011) that F2P management is more microeconomic (continuous-incremental-iterative-real-time) based on specific metrics on A-R-M-D balances contrary to macro-management of P2P games. A minimalist version of the F2P game is first produced by reactive and agile teams. Because non-financially committed players can easily quit, new types of items (comfort item to reduce waiting time and booster items to double experience gains from a quest) are created in F2P to remove players' constraints in gameplay (time, patience, social network). The switch to F2P by traditional P2P genres with no in-game items (sport and puzzle genres) induces the creations of both items and immersive narration¹⁵. Managing a F2P game means managing production and consumption at the same time in a co-creation process within A-R-M-D dynamics. The inner innovation process is different between P2P and F2P. Old and new skills are required to be successful with a free business model. Both paid and free models require a great concept to be successful (FREEMAN, 2011). The retention stage, which is a traditional skill of the developer, is therefore the most important success of the condition of

¹⁵ e.g. the difference between the first shareware "Bewejeled" game with simple graphics and challenges and more recent puzzle competitors with richer narration and items choices (e.g. *Candy Crush* or *Diamond Dash*).

monetization and acquisition strategies (without retention, acquisition and monetization have no value). The new skills are managing:

- innovations in the game through iterations and simulations based on real-time testing of levels and items: launching, testing and fine-tuning the experience constantly and observing how players react, listening to feedback and re-building;
- a heterogenous players' community with paid and free players on an individual basis. This requires key technical resources such as CRM and expertise in providing services and infrastructures to accommodate huge customer bases of millions of players;
- an e-shop and micropayments systems for all players;
- narration in games and especially for genres that didn't used to have one (especially sports and puzzle genres) ¹⁶.

We have delimited the borders of paid and free models. Based on this section, we propose in the next section to analyze a recent evolution of the business models in the video game industry: a mix of paid and free components to deliver a more comprehensive service to players.

■ Hybridation of paid and free business models: towards a comprehensive service-based business model

Beyond the DNA of each business model, we now focus on the core and optional components to highlight the recent trend of hybridation of models.

Core and optional components of P2P and F2P

Historically, digital business models were mainly based on providing a free or paid access to the essential or core contents. With time, developers have given access to extra contents and have diversified their main source of revenues.

¹⁶ In-game Innovations should be managed carefully since they are new components (and skills) for casual gaming developers. For example, in *PlantvsZombie2*, there are more choices of plants and more narration (the player travels through time on a map before playing levels). However, the player must replay two, three times the same levels to win stars or bones to open doors to level up. From our point of view, the gameplay is not as much fun as in the Pay-to-Play first version.

Evolution of P2P models

The basic unit price model for a premium version has survived to digitalization and the economic architecture has remained the same (purchase, download and play). It has been enriched by out-game services provided by distribution platforms. For example, Steam (public platform ¹⁷) or Battlenet (private platform) have innovated in services around the paid game: automatic updates and patches, dynamic pricing and special deals, easy access to sequel, add-ons and additional contents such as mods by players and e-sport service, etc. Then, the paid model has extended to provide for a continuous online gaming service, especially for MMO games. The subscription model was introduced with or without a unit price to get access to one game or a bundle of games (e.g. on TV or on multigames platforms on PC like BigFish ¹⁸). Freemium is another evolution of P2P: it has a free trial period at the end of which the player must pay a unit price to access the premium version. A freemium full version is a finished product: the game has an end and the player must wait for the next sequel to be available to keep on playing.

Evolution of F2P models

First, the free model was only supported by ads (or out-game revenues) and was mainly used for small casual games (e.g. Addictive games, Pogo.fr, Yahoo !Games portals). The game is free as long as an ad is viewed. To skip the ads, the player must pay a unit price. It looks like paying for comfort (and this idea will be reused later by the F2P model). However, players highlighted two main drawbacks of this model: either the game was of lower quality due to lower budget or less fun because of the interruption of ads (OLSSON *et al.*, 2010). From developers' view, advertising can generate significant revenue but only for the top-selling games. The model evolved into the F2P or microtransaction model where the access remains free but revenues are based on the sale of in-game items using real-money. The revenues can come also from other types of in-game transactions: player to player transactions. A fee is collected by the developer as a percentage of the amount of the transaction either for earned items or UGC items (e.g., *Team Fortress 2*). Advertisement can nevertheless keep on being a

¹⁷ In a public platform, the owner gives access to games also produced by other developers and is not limited by the distribution of games only developed by the owner of the platform (private platform).

¹⁸ BigFish generated \$130m in revenues in 2010 (CHANG, 2010).

complementary source of revenue for the F2P model if it is embedded in the gameplay (i.e., being a source of rewards for the player watching it).

Evolution towards hybridation of paid and free models

The current trend in digital business models is that monetization is no longer a unique source of revenues but a combination of options. Progressively, mixing components of pure digital models delivers richer and more customized experiences to players though it also blurs the borders of each digital business model.

Below are some examples of hybrid models:

- *Sherlock Holmes : Le chien des Baskerville*, edition collector on PC: Freemium games (free limited access for 1h + unit price/subscription of 11,99€),
- *Red Dead Redemption and Borderlands*: unit price + downloadable contents/items as missions and new characters (yielded Take 2 Interactive \$34m in digital sales in late 2010) ¹⁹,
- *Diablo3*: unit-price + in-game taxation of real-money transactions in in-game auction house among players ²⁰,
- *FIFA13* and *Ultimate Team mode*: unit price + out-game real-money transactions of cards on PC and mobile phones to customize and manage teams ²¹,
- *Minecraft*: unit-price + out-game real-money purchase of modding options for mini-games (Minecraft),
- *World-of-Warcraft*: Unit price + subscription+ free limited period + out-game on-demand items/services sales (transferring a server, a name change or avatar's appearance change) + downloadable paid (sequels) + free (mods) contents,

¹⁹ Source: VAN DREUNEN (2011).

²⁰ In *Diablo 3*, there are two auction house systems: one based on in-game gold found and one based on real currency. The real-money auction house in *Diablo 3* provides a safe way for players to buy and sell loot they find in the game for a maximum price of \$250. It works like an auction platform inside the game and Blizzard, the developer, catches a \$1 fee charge for an equipment item that is unique (weapon, armor, accessories) and 15% of final sales price for commodities (gems, materials, dyes, recipes... non unique items). (Source: "Transaction Fees for Diablo 3 Auction House" (2012/05/01), <http://www.gentlemensdiablo3.com/2012/05/transaction-fees-for-diablo-3-auction.html>) (2014/01/13) and "Gameplay-auctionhouse-fees" (2011), <http://us.battlenet.net/d3/en/game/guide/items/auction-house#fees> (2013/04/05).

²¹ Source: "FIFA Ultimate Team", <http://www.easports.com/fr/fifa/fifa-ultimate-team/xbox360> (2014/01/14)

- *Team Fortress 2*: F2P + premium access for paying players (who bought the game when it was P2P or an item in the e-shop) + e-sport (since 2009). Premium account gives access to different services/items (crafting of special/rare items and tools, upgrades items/services, bigger backpack, giving gift, special rare and cosmetic items) ²².

- In 2013, some producers (e.g., Electronic Arts *FIFA*) introduced the sale of additional mobile companion app with a F2P model as part of the console P2P video game where the player can perform activities related to the main game. The aim is to capitalize on cross-platform gaming.

We now propose to map more precisely the components of player's experience and of the content of the game in the digital business models in the video game industry. It appears that the main components are: the access to the game (free or paid), the scope of the accessible gaming experience and contents (premium and full experience or limited experience), the types, extent and prices of complementary optional services around the core service such as items (including hints, extra contents), subscription for extra services (such as modding), accounts management, e-sport, the access to other players and their price (friendship/social, trading, chatting, helping, creating together), the locus of transaction of complementary services (in-game or out-game), the currencies (only virtual or real or both) and the sources of monetization (direct and indirect: ads, extra services, relationships with other players, items, etc.).

Since digital business models can be finely tailored to meet players' segmentation, we agree with LEE (2013) on the absence of superiority of one model over the other. It is the whole gaming experience bundle that creates the values and that is a basis for differentiation in a competitive environment.

■ Conclusion

With the diffusion of the Internet and mobile devices gaming, digital business models in the video game industry have evolved from paid to free models with a broad variety of hybrid models. Experimentation with new revenue models has changed the business models and the management of

²² Source: <http://www.teamfortress.com/freetoplay/faq.php> (14/01/14).

innovation. Nevertheless, models have been mainly discussed in industry but little in academia. Grounded in an interdisciplinary microeconomic and business models literature, this paper contributes to the literature by providing insights into the economic architectures of paid and free digital models. We make explicit their DNA to provide guidelines to choose the correct business model. We map the diversity of hybrid models based on concepts of core and optional services to help other sectors to develop their own business models based on video game industry lead-user innovations.

References

- BAND J. (15/10/2013): "To Infinity and Beyond: Business model Adaptation in the Video Game Industry", <http://www.project-disco.org> (2013/12/06).
- BEHRMANN M. (2012): "Digital Games – Looking for Business Models", IPTS Conference Brussels, Oct., European Games Developer Federation.
- BOURCIER L. (2012): "Game in Progress – new Business Models for the Video Game Industry", 4th April, <http://fr.slideshare.net/LucBourcier1/game-in-progress-new-business-models-for-the-videogame-industry-12278071>
- CECI M. (2014): "Rules for value Modelling in Online Digital Distribution: the video game industry", working paper.
http://www.csw.inf.fu-berlin.de/vmbo2014/submissions/vmbo2014_submission_10.pdf
- CHANG O. (2010): "Casual Games Publisher Big Fish in Track to Make a Least \$130m This Year", *Forbes.com*, November 22.
- CHESBROUGH H. (2010): "Business Model Innovation: Opportunities and Barriers", *Long Range Planning*, April, Vol. 43, Issue 2/3, pp. 354-363.
- COSTIKYAN G. (2014): "Ethical Free-to-Play Game Design (And Why it Matters)", (2014/01/10),
http://www.gamasutra.com/view/feature/207779/ethical_freetoplay_game_design_.php (2014/01/16).
- CRAWLEY, D. (2011): "Over \$1K for a virtual spaceship? 2000 Dark Orbit players say 'yes'", (2011/11/25), <http://venturebeat.com/2011/11/25/dark-orbit-space-drone/>.
- DAVIDOVICI-NORA M.:
- (2013a): "Innovation in business models in the Video Game Industry: Free-to-Play or the gaming experience as a service", *The Computer Game Journal*, December 2013, Special Edition on Entrepreneurship.
 - (2013b): "Innovation of business models: from F2P to experience as a service", *Evolution of video games industry's ecosystems conference*, Dec 4th 2013, Paris.

- EL SAWY O. A. & PEREIRA F. (2013): "Digital Business Models: Review and Synthesis ", Chapter 2, in *Business Modelling in the Dynamic Digital Space - An Ecosystem Approach*, Series SpringerBriefs in Digital Spaces
- FREEMAN W. (2011): "Beyond free-to-play: The future of game monetization". <http://www.develop-online.net>, Oct. 14th.
- HAMARI J. (2009): Virtual Goods Sales: New Requirements for Business Modeling? *Graduate thesis in Information systems Science*, University of Jyvaskyla, Dept of computer science and information systems.
- HARRIGAN K. A., COLLINS K. & DIXON M. J. (2010): "Addictive Gameplay: What Casual Game Designers Can Learn from Slot machine Research", *FuturePlay@ Vancouver Digital Week*, May 6-7, Canada, ACM.
- KALLIO, J., TINNILA, M. & TSENG, A. (2006): "An international comparison of operator-driven business models", *Business Process Management Journal*, 12, 3, 281-298
- LEE R. (2013): "Business Models and strategies in the VGI: an analysis of Activision-Blizzard and Electronic Arts", June, *Master Thesis in Management Studies*, MIT.
- LOVELL N. (2011): "Whales, Dolphins and minnows: the beating heart of a free-to-play game", <http://www.gamesbrief.com> (2011/11/16).
- LU M. (2014): "Lessons on Mobile Gaming from a Whale" (14/10/01). http://www.gamasutra.com/blogs/MikeLu/20140110/208428/Lessons_on_Mobile_Gaming_from_a_Whale.php
- MACCHIARELLA P. (2012): "Trends in Digital Gaming: Free-to-Play, Social and Mobile Games", Park Associates, Whitepaper.
- MAGRETTA, J. (2002): "Why Business Models Matter", *Harvard Business Review*, 80, 5, 86-92.
- MAIBERG E. (2014): "League of Legends revenues for 2013 total \$624 million", 2014/01/19, <http://www.gamespot.com/articles/league-of-legends-revenues-for-2013-total-624-million/1100-6417224/>
- MARCHAND A. & HENNIG-THURAU T. (2013): "Value Creation in the Video Game Industry: Industry Economics, Consumer Benefits, and Research Opportunities", *Journal of Interactive Marketing*, 27, pp. 141-157.
- McKINSEY (2011): "Gaming Expands Its Presence in the Digital Universe", Insights from McKinsey's GlobalConsumer Research, Sept.
- MOREL R. (2012): "Choosing the right business model for your game or app", Aug. 27, <http://www.adobe.com/> downloaded on 23/04/14.
- OLSSON B. & SIDENBLOM L. (2010): "Business Models for Video Games", *Master Thesis in Informatics*, Lund University, School of Economics and Management, Departement of Informatics, 94 p.

ROSE M. (2013): Clash of Clans' 5 keys to success, (2013/01/28), http://www.gamasutra.com/view/news/185406/Clash_of_Clans_5_keys_to_success.php (2014/01/16).

ROWLINGS T. (2014): "Top Tweets from Steam Dev. Days, Day 2", (2014/01/16) <http://www.gamasutra.com> (2014/01/20).

STUART K. (2011): "The metrics are the message: how analytics is shaping social games", July 14th, <http://www.theguardian.com>, games blog (20/12/2013).

VAN DREUNEN J. (2011): "A Business History of Video Games: Revenue Models from 1980 to Today", 11 p, *The Game Behind the Video Game: Business Regulation and Society in the Gaming Industry*, New Brunswick, New Jersey, USA, April 8-9, 2011.

VANHATUPA J. M. (2013): "Business Model of Long-term Browser-based Games – income without Game Packages", *International Journal of Computer Information Systems and Industrial Management Applications*, 5, pp. 195-202.

WEILL P., WOERNER S. (2013): "Optimizing Your Digital Business Model", *MIT Sloan of Management Review*, March 19.

YANNOPOULOS P. (2013): "Business Model Innovation: Literature Review and Proposition", *Proceedings of International Business and Social Sciences and Research Conference*, 16-17 Dec., Cancun Mexico