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Paving the way to e-services: Innovation through online games

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22nd European Regional ITS Conference

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Giuditta De Prato, Jean Paul Simon

**Paving the way to e-services:
Innovation through Online games**

Abstract

The transformative power of organizational and service innovations on value or supply chains has been the object of several studies. The question identified in this paper is how disruptive trends in the videogames world can have spill-over effects in the broader realm of e-services. Section 1 opens with a brief review of literature. Section 2 proposes a description of the on-line games industrial ecosystem, the characteristics of the production process and the value chain in the online video games industry. The main techno-economic models for the production and distribution of online games are described in a third section with an emphasis on service creation, and illustrated by some case studies. The last part highlights the trend of innovative paths towards an economy of e-Services which are driven by the evolution of online games in a converged environment.

Keywords: Online value creation, virtual world, virtual good, value chain, digital content convergence, new business models, services.

Author affiliation: EC JRC-IPTS, Seville, Spain. This paper is based on the JRC-IPTS Report “Born digital/ Grown digital. Assessing the future competitiveness of the EU video games software industry”. Corresponding author: giuditta.DE-PRATO@ec.europa.eu. The views expressed in this paper are personal and may not necessarily reflect those of the European Commission, unless explicitly stated otherwise.

Introduction

This paper is based on a comprehensive survey of the video games software industry with a focus on the EU competitiveness¹, and concentrates on one aspect of this research. The investigated research question is how disruptive trends in the videogames world can have spill-over effects in the broader realm of e-services, paving the way for innovative business models.

In less than 40 years, software games developed from scratch into an industry producing billions of profits and today, its revenues and investments give the video games industry a relevant position among other mainstream media industries. In the period 2004 to 2013, the global video game market is expected to grow from less than 30 billion to over US\$ 70 billion (PWC 2009). This market is expected to grow four times faster than the media and entertainment market² as a whole. The former is expected to grow by almost 70% by 2013, whereas the latter is expected to grow by only 17%. In the UK, the video game market outgrew the cinema market in 2009³ and playing games online is now as popular as downloading music and video.⁴

The growth of the video games software market is expected to be primarily driven by online and wireless game software, while hardware would proportionally decline in terms of revenues, changing hence the rules of the game. It is forecasted that especially the online space will substitute on the long run the currently available boxed product.

I.THE LITERATURE: A QUICK REVIEW

The research is based on our syntheses of the current state of the knowledge, on internal and external expertise, literature reviews and desk research, as well as several validation workshops with industry participants and experts. For the on-line part of our work, we reviewed the major attempts to define and categorize on-line games as this was a prerequisite to even quantifying the economic value of the sub-sector.

¹ The report "*Born digital/ Grown digital. Assessing the future competitiveness of the EU video games software industry*" was released in November 2010. This report reflects the findings of our study on the video games industry, with a focus on two specific activities: on-line and mobile videogames.

² Media & Entertainment includes: internet access fees, internet advertising, TV fees, TV advertising, Recorded music, Filmed entertainment, Video games, Consumer magazine publishing, Newspaper publishing, Radio, Book publishing, Business-to-business publishing. Source: PWC.

³ Cinema market: theatres and DVD. BBC News, Wednesday 24 March 2010: "*Rupert Clark, an analyst from consulting firm Deloitte, said that the global games industry now makes more money than the box office*";

⁴ Ofcom Communications Market Report, August 2010. Available at:

http://stakeholders.ofcom.org.uk/binaries/research/cmr/753567/CMR_2010_FINAL.pdf

The OECD Working Party on the Information Economy (OECD, 2005) draws a line between the online and the offline video games industries. The OECD definition also takes the hardware platform⁵ into account: while it identifies different trends for offline games depending on their platform,⁶ it forecasts strong growth for online games irrespective of hardware platform. This makes it possible to consider the online segment without differentiating it by hardware platform, but simply by referring to the fact that the game is played over the Internet. Most of the literature agrees on this approach and considers online games irrespective of the underlying platform, so long as it permits "*at least some sort of network connection*".

The aspect of interactivity is horizontal to all video games, as they all share the characteristic of being "*an interactive kind of mediated entertainment*" (Jansz and Martens, 2005), and without the user's interaction the game simply cannot proceed. However, the meaning attributed to interactivity is evolving, and with regard to (online most of all) video games it refers to the capability of the gamer to influence what happens in the game by means of actions performed via an interface (Grodal, 2003; Vorderer, 2000). This interactivity is pushed to the maximum in online gaming, where the gamer interacts not only with the game itself, but also, in many cases at the same time, with other gamers by means of the moves in the played game. Through this kind of interaction, the game enters the sphere of interpersonal communication. This "*social context of game*" is very important as a trigger to push gamers to play online multi-players games. This has pulled the demand for this kind of online games, leading to the definition of two bigger categories in games which are played over a network: games that the user plays alone over a network, and games which allow the user, by means of the underlying network, to interact and play with other players.

Using this approach, online video games can be divided into two main sub-categories, with often very different characteristics in terms of game structure, user interaction, and most of all underlying business model. One or more specific markets correspond to each of the subcategories. This basic distinction drawn is the one between *single user games* and *multiplayer games*. The former are generally available as "*browser games*", which are played by means of a web browser and typically do not require additional software, specific to the game, to be installed.⁷ Multiplayer

⁵ In the cited work (2005), the OECD groups platforms in three big categories: PC, console, and wireless, and adopts a perspective similar to that of some major consultancy and market data firms. The difference between this approach and the one adopted in the present work has no relevant consequences. In the present work, a slightly more detailed classification of platforms has been adopted for the sake of clarity and because it allows us to address specifically the oligopolistic situation in the hardware production of handheld gaming equipment.

⁶ While the off-line PC video games segment is considered already mature, moderate growth is expected in the off-line console segment. Strong growth is expected to continue in the off-line wireless segment (OECD, 2005).

⁷ In some cases, slightly different specifications of the definition are proposed, when for example games with multiplayer capability are named "Internet games" to distinguish from the simple single-user "online games", as done

games, however, are instead usually (still) played in the form of "*client-based games*", where the activity required of the client machine is still relevant, its performance and elaborating power still matter and possibly some kind of software programme or engine has to be installed on it. It is rather common to find nowadays these labels in the catalogues of successful game producers, and they represent the evolution of the previous categorisation, now rather obsolete.

From a methodological viewpoint, one may add that it is not easy to quantify economic activity in the software market, where production is not accurately represented in official statistics. Measuring and monitoring the evolution of the online games segment is even less straightforward, due to the characteristics of the product itself and to the consequent lack of basic indicators suitable to frame in a single picture the complexity of the different sub-categories and articulated typologies which online gaming implies. Usage statistics and download numbers are often the only available ways to integrate data in order to monitor the dimension of the online and mobile markets⁸. This is especially true where free applications are concerned as the easier accountancy of subscribers and paying customers is not possible.

2. THE ON-LINE GAMES INDUSTRIAL ECOSYSTEM

As for so many other content and media industries, the potentially most disruptive one is that video games are increasingly going online. Driven by increasing broadband connectivity, online capabilities of consoles and handhelds and ever-enhanced capabilities of mobile phones and smart phones, online and mobile games as underlined already represent the fastest growing segments of the industry. This trend has been ongoing for quite some time now. Commercial multiplayer online games emerged already in the 1990s. The major console manufacturers launched networks (e.g. PS2 Network gaming and Xbox live) to support online play and to download additional content in the early 2000s (Kerr 2006). Major off-line games also started to include online elements where players post scores on online leader boards, to buy add-on elements, download updates or to play against other gamers (Miles and Green 2008).

The online segment alone of the video game industry has a number of business models, monetisation techniques, and variations in the value chain structure which are directly influenced by aspects such as the number of players, the presence of persistent virtual worlds, the type of user

by Internet.com in its webopedia definition (available online at: http://www.webopedia.com/TERM/I/Internet_game.html; last checked on 12 March 2010).

⁸ For instance, Web information companies such as Alexa propose traffic ranks of categories of web sites. Appdata.com (www.appdata.com), for example, made figures available with regard to the users of applications inside a social network like Facebook

engagement and viral distribution mechanisms. Therefore, an effort to address the online games segment must take into consideration all of the above mentioned characteristics. The following sections will try to identify both the similarities and the differences in the ecosystems of the two broader aggregations, which are:

- simple browser-based (mostly stand alone) online games, and
- complex persistent multiplayer (mostly MMOGs) online games.

These broader aggregations of typologies of online games, even if less accurate, find their legitimacy in the market, where they are normally used to refer to one or to the other of the two big worlds of online games, by addressing the categories at their extremes but without neglecting the opportunities which the market can exploit and which come from the specific sub-categories in each of the two worlds.

The following model for digital mass consumption (Feijóo et al., 2009) proposes three main stages, the first of which includes the process of creation/ production/ publishing, the second considers the delivery / distribution / access and the third deals with the use /consumption / interaction. This model is applied to the online gaming ecosystem in table 2.

The core technical component of online games is represented by a piece of software. The innovation which online games have brought about was based on the co-evolution of the software core component, the content and the distribution model (and channel). Innovation in content quality and typology and in deployment was made possible by a corresponding transformation of the core software part, which basically allowed both a product innovation and a process innovation to take place.

The additional characteristics of online games complicate the picture even further. Online games share with the video game sector most of the peculiar characteristics of its production process, in particular the high ICT intensity and the highly technical nature of the creative activities leading to the production itself. It also shares its specific organization around hardware platforms. The co- existence of different platforms affects the whole first stage in the proposed model (Mateos-Garcia et al., 2008): i.e. the production, the distribution and the publishing. Each platform provides specific requirements in terms of industrial and technical infrastructures. Nevertheless, when online games are considered, the consequent differences in the business models adopted tend to be smoothed by the predominant characteristics of the online access, fruition and interaction that come into play in the second stage.

Table 2: Digital consumption model and online games categories

	Browser G. (BBGs)		Client-based G.		
Stages in digital consumption / types of games	Stand Alone	Multiplayer	Stand Alone	Stand Alone	Multiplayer (MMOGs)
Stage 3					
Consumption (Narration / Content)	Simple	Low complexity	Simple	High complexity AAA ⁹	
Use: Virtual Worlds	Simple		Persistent		
Interaction & Communication	None	Simple	Simple	None	High & Complex
Stage 2					
Delivery	Online		Download & Online		
Distribution	Easy / browser based / social networks / viral		Relatively complex / Platform Portals / Retailers		
Access	Easy / gen. Free		Relatively easy / diff. Models / Retailers		
Stage 1					
(Creation) Development	Simple / Low Investment Required		Complex / High Investment		Very Complex / Huge Inv.
Production Proces & Techn.	Simple / Standard	Complex	Complex		Complex / Persistent team
Publishing, Marketing	Simple / Online Ad	Simple / Online Ad	Online & Offline Ad	Online & Offline Ad	

A. The ecosystem of browser based games (BBGs)

The browser-based game (BBG) scenario proposes the simplest solution to playing online: accessible to everybody, in most cases for free, offering simple, cheap and easy “casual”¹⁰

⁹ The label AAA, or Triple A, is used to refer to the top class characteristics of the most complex games (not simply A category, but AAA).

¹⁰ In this case the interpretation for the world “casual” must be that of the video game jargon, as in most cases the casualty pertains to the type of engagement and effort that these games require to the user, and not to the lack of

entertainment to the widest variety of users of basically all ages. The narration is not articulated, so the effort in terms of time investment per game required of the player is not high. Generally the virtual world proposed, if any, is simplified, as are the graphics, so no last generation hardware is necessary. Users prefer to play stand alone games, possibly to fill in a short break rather than to invest a lot of their free time, and the level of inter-user communication and interaction is absent or very low. These games can also be played by multiple players, and what differentiates these games from the complex MMOGs is the simplicity, recognizable in easier graphics, easier plot, and easier interaction. The multiplayer situation, nevertheless, guarantees the participation of users in the content development, both by means of interaction and of new content development. This could be an important hidden strength of this kind of game from a market perspective, as it is connected with several new business models allowing micro-transactions involving virtual items and game improvements of a number of types.

When considering the second stage in the digital consumption model, these kinds of games are distributed by allowing access online. In most cases, the right to play the game is granted for free and the distributor gets revenue through advertising, but also through subscriptions for a period of time or, a trend becoming more and more important, payment for the purchasing of digital goods or additional content.

The distribution, in many cases, takes advantage of the viral diffusion capacity typical of social networks: in such environments, users can invite friends to join their network and connections. By accepting, the newcomers share resources and get to know and to try their friends' favourite games. This allows for an incredibly fast spread of a new title without any big advertising efforts.

The development time for BBGs' projects is generally short, and the level of investment required by the production of a title is low. Publishing usually takes place on dedicated web sites acting as portals of online BBGs, where a huge number of games is offered and users know how to find their favourite types or to look for new experiences. The role of portals is in many cases very relevant, as they allow for new title visibility. Without them, it could be extremely difficult to compete successfully with the incredibly high number of available games. Actually, the low requirements in terms of initial investment, development resources and distribution efforts allow many companies, including small ones, to enter the business and develop new games. In spite of the free-to-play approach which is very common, this type of game has already demonstrated that it can guarantee important revenues and for this reason is a fairly contained risk. In fact, not only complex MMOGs

loyalty of users towards their favourite games. On the contrary, in many cases easy and simple browser based games, casual in their genre, have an enormous amount of very loyal users.

but also many simple BBGs are forecasting impressive figures in terms of numbers of users, and approaches like that of micro-transactions are diffusing at a very high rate. Even if the per unit revenue from the sale of a virtual good is minimal, the availability of millions of users easily makes the market sufficiently profitable.

Many analysts foresee further growth in terms of market share and number of titles for the smaller, cheaper, simpler browser-based games. In particular, Lightspeed Venture Partners foresees that the evolution to a “Game 2.0” situation will be brought about by browser-based online games rather than by client-based online games. Social games will lead this process, due to the viral marketing capabilities of the social networks that they can exploit, providing them with the possibility of increasing the number of users exponentially overtime.

B. The ecosystem of MMOGs

MMOGs are the most typical example of client-based, multiplayer, highly complex video games where users are confronted with a persistent world, real-life style graphics and evolved development of characters. Among users, communication is intense and relies on many tools, the system resources exploited and required are huge, and the investment in terms of users’ time is also considerable. The virtual world that users access is impressive.

The distribution is relatively complex, as big dedicated portals are in charge of delivering software and access to users depending on the platform adopted. Titles are differentiated by platforms, and not necessarily all famous games are available for all the main platforms. In particular, the policy followed by console owners has been rather differentiated up till now.

Efforts are currently being made to provide independent developers with alternatives to the limited distribution channels available at the moment, and platforms are offering specific technologies to reduce the obstacles to game distribution, for example by allowing video games to be embedded anywhere online.

The development requires huge efforts and impressive teams, the most advanced techniques are applied to improve the rendering of real effects, integration of real landscapes, textures and advanced graphics. Physics and rendering engines are exploited together with other middleware tools to improve the results and the impression of reality (De Prato, 2012).

Moreover, the management of such projects must take into account a number of problems which occur due to the persistence of the related virtual worlds: the results of user interaction in massive multiplayer environments is to very difficult to predict; sets of different levels of play have to be continuously developed. As a consequence, a team of developers must be kept active on the project after the product is officially released, unlike what happens in normal software development where probably only a bug fixing team is kept on to intervene in case of necessity. Besides, the game never really “switches off” or goes offline: the management of devoted servers has to be

taken into account, as the game plot keeps being developed by the interaction of developers and users, while server technologies become more and more important.

As one would expect, the cost of production of a title of this last type is many times bigger than that of a browser-based, stand-alone game. For example, Lightspeed Venture Partners estimated (Liew et al., 2008) a production cost of about US\$ 30 million for a title such as Halo 3, one of the most famous and successful video game titles for Microsoft Xbox, with this version providing online multiplayer playing possibility.¹¹ The same source estimated that the cost of production of the Zynga browser-based online game, Texas Hold'em, was less than US\$ 1 million. Of course, the disparity is based on the differences in the game graphics, plot, complexity and in all the previously mentioned aspects. Nevertheless, it is also worth pointing out that, if Halo 3 in 2008 was expected to reach 10 million players, the Zynga's title was scoring around 8 million. Even though the browser-based title was raising a small amount of money per user, the target pool was big enough to guarantee a sound success in terms of revenues.

The first type of game is basically the transposition to the online environment of what core games used to be on offline PCs or console platforms. Those expensive games, built upon large budgets and possibly running to many subsequent editions, were called AAA games. An AAA title collects a very high number of users in the first phase after its release, and this number then progressively decreases as the offline advertising effort is reduced.

3. THE TECHNO-ECONOMICS MODELS

The main elements of the 'new economy business model' (Lazonick, 2006 cited in Teipen, 2008), primarily identified in the US ICT industry, consist of rapid product development for new markets, vertical specialization of companies in the value chain, the financing of companies by venture capital institutions and a highly flexible labour market. A similar framework was encountered when, after 2000, the convergence of the video game market towards a limited number of increasingly powerful console or handheld hardware manufacturers triggered concentration at the different levels of the value chain.

A first phase in the pre-online video game evolution saw very fast improvement in video game quality (in terms of graphics, realism, soundtrack, complexity and so on), made possible by the parallel increase in the power of consoles and PCs. To exploit the ultimate technologies and processing capabilities, big development projects concentrated on AAA-type games, whose complexity required huge teams, highly skilled project organisation, long or very long development time (up to years), and generally enormous budgets. In most cases, publishers financed

¹¹ By means of accessing the Microsoft Xbox Live Arcade online portal.

development. When they were not agents for pre-developed products, they acted basically as financing entities, making it possible for developer teams and independent studios to afford the production of new games. Project costs were partially or even totally covered by publishers, leaving little room for self-financed or independently produced products, for which publishers were called only for bridging between production and distribution and retail.

A. Changes in the value chain

Publishers are often presented as the central economic actors in the video games value chain, ruling the overall organisation of the market. The strong position of the publishers is due to their specific intermediary role in the value chain: they have the scale and skills to generate the relevant deal-flow, manage large budgets, develop global branding, and organise marketing and property rights. They often integrate several positions in the value chain vertically, growing their own developer departments, absorbing developer companies or acting as distributors and retailers. The progressive but impressively fast switch to online gaming introduced new distribution methods and started to rearrange the relative roles and interaction dynamics among the actors at the different levels in the supply chain.

Clearly, logistics has lost relevance in the online games segment due to the fact that digital goods are reproduced and distributed over the network at low cost. Online digital distribution has affected the value chain structure, resulting in a convergence of the roles of the distributor and of the retailer under the range of activities of the publisher. A whole part of the core business involving publishers, distributors and retailers has basically disappeared as there is no longer any need to duplicate physical products because these can be distributed over the network. The publisher, in many cases, directly distributes games, without the need for a distributor to act as intermediary between the publisher and the retailer: i.e. "*disintermediation*" is taking place, cutting out the role of the distributor.¹²

Publishers can also opt to distribute games through Internet Service Providers (ISPs). ISPs act as content aggregators and provide portals for game distribution which allow easier promotion and localisation of new games by users; at the same time they attract advertising which brings an added source to the mixed revenue models. The increasing importance of ISPs has triggered a process that is often labelled "*re-intermediation*": ISPs are taking on the role previously played by distributors. Possible legal limitations have to be taken into account, though, when considering this process.

¹² Disintermediation is also taking place in the case of off-the-shelf games, where the increase in structure and negotiation power of big retail chains has allowed them to interact directly with publishers, leaving distributors with a marginal role.

These changes to the value chain of online video games, as compared with that of “traditional” video games, affect not only the interactions between the actors in the value creation process, but also the type and number of actors involved. Different types of games are affected to different extents. The switch to online distribution has drastically cut the need for physical logistics. A whole part of the former business - manufacturing boxes, printing electronic support (disks, etc.), the organisation and the infrastructure of distribution, retail sales, inventory, and returns – has disappeared.

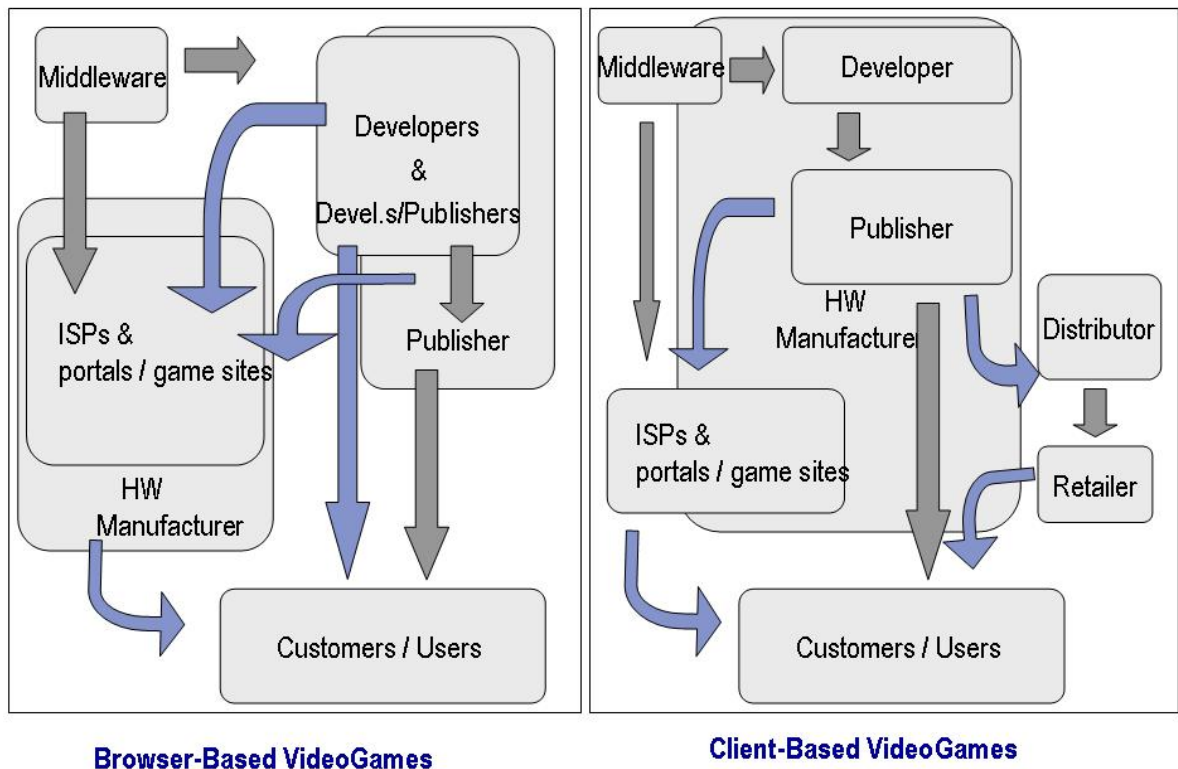
Though the characteristics of browser-based games have heavily reduced the need for distributors and retailers for logistic support, portals and dedicated sites with adequate visibility are required. In some cases, developers can afford to publish their browser-based games directly, shortcutting the next stages along the value chain.

This is not necessarily true for client-based online games, particularly the complex and expensive games, which in many cases still rely on the more traditional chain to reach consumers.

Figure 2 provides an overview of the changes to the value chain, for browser-based games (left panel) and client-based games (right panel). The arrows in the figure represent the flows along the value chain, and boxes represent the actors and steps. The dimension of boxes is different in order to provide a qualitative glimpse of the changes brought about by the switch to online to the video game value chain (bigger boxes show the increased importance of the actor along the value chain).

In the left panel, developers can take shortcuts to reach the users directly. However, the role played by publishers and new actors like portals and ISPs could also grow as they will make the identification of new games easier and facilitate access to specific categories. In the case of console-based online games, hardware manufactures especially could still play an intermediation role, in the case of BBGs and CBGs. In the right panel, moreover, some room is still available for distributors and retailers, while it is more difficult for developers to reach users directly.

Figure 2: Value chain in (re-) construction: comparison between value chain of browser-based online video games and of client-based online video games



Source: Author's own elaboration, inspired by data from the OECD Working Party on the Information Economy (OECD, 2005).

B. The business models

In the above framework, sources of revenues and business models are bound to change, and to keep evolving at the same pace as the underlying products, or services. Moreover, with regard to online games, the wealth of different types of games and the variety particular features to attract customers make the landscape of business models rather articulated. This is not restricted to the online games industry, which provides a playground where various new forces are confronting each other and co-evolving.

The alternative business models which users face when entering the world of online games are actually rather different from those they were used to. At least in the first phases of the online era, video games publishers tried to adopt the "old" video games industry business models. In the offline world, publishers used to hold the rights for the games, and licenses from software developers had allowed both publishers and console manufacturers to profit. The latter were even prepared to sell console hardware at loss per unit, while game titles were often pre-sold to

publishers. A new title was generally expected to reach break-even point in the first few months after release, when some hundreds of thousands of copies had been sold.

Currently, the emerging revenue stream from selling virtual goods online is attracting a lot of attention in the online video games industry (Wi, 2009).¹³ In-Stat (2011) forecasts that total virtual good revenues will reach more than \$ 14 billion by 2014¹⁴. The virtual items model allows gamers to buy individual digital components such as virtual currency, items, characters, and any in-game good which are not a full game in themselves. The purchase of virtual items is generally associated with games providing persistent worlds and character building capabilities, therefore MMOGs are the category where this monetarisation method can be better exploited. This model does not suit those MMOGs which still ask users to pay monthly fees, but rather those which allow free access, i.e. Lite MMOGs.

The flexibility of this model is bound to be exploited by creative producers and publishers. Basically, every item could be sold as a virtual item. This allows extending the exploitation of virtual items to a specific genre or category of games, but leaves room for creativity to find different interpretations and applications of increased and consolidated users' acceptance of this type of cost. For example, now not only is virtual money is sold, but also "powers" or characters' features, together with extensions to the gaming experience of various types: soundtracks, scenarios, and textures - anything that can be transformed into a virtual item.

As regards demand, consumers are attracted by the free-to-play (F2P) approach to the video game main product, because they see it as less of a financial risk. Users are more confident and more willing to pay small sums for digital items offered to enhance their gaming experience, once they already know the game itself and enjoy playing it.

As regards supply, publishers are motivated to adopt the virtual items model by the huge difference in sales life span between virtual items and the games themselves. Virtual items have a much longer life in terms of sales, a major advantage for the seller. A single virtual item product could be sold online for years, while the "productive" life of a standard game is of some (or, more often, only a few) months.

Western games publishers have been migrating in these years towards micro-transactions, putting the sale of virtual items at the centre of their monetarisation models. European and North American users now feel at ease with buying digital content, as reported by DFC Intelligence

¹³ For a description see Wi, J.H., Chapter 2, "Business models and corporate strategy".

¹⁴ Zynga clearly leads with \$ 364 million in 2010, to be noted that the first EU firm, Bigpoint, ranks n°5 with nearly \$ 55 million of revenues.

(2010), and the *virtual item model* has been fully adopted, thanks also to the popularity and viral diffusion of social network games.¹⁵

Social network games like Farmville from Zynga, Free Realms from Sony Online Entertainment and Combat Arms from Nexon have been able to attract millions of users while monetizing through virtual goods. FarmVille, available only on FaceBook, has 30 millions "farms", against the 2 million "real" farms present in the US, and to play is free. FarmVille earns its company Zynga an estimated US\$ 200 million per year, It keeps a team of 15 developers working to release new virtual items, such us tractors (800 thousand sold every day) twice a week. Free-to-play online games have also been successfully issued by European companies, such as Gameforge and its Metin2, the largest massively multiplayer online game in Europe. In Germany in 2009, the two browser-based game companies Bigpoint, but also Gameforge were among the five fastest growing IT companies of the country¹⁶.

DFC has forecast that the market in 2010 for Lite MMOGs will be around US\$ 800 million in North America and Europe, and that it could reach US\$ 3 billion by 2015. Asia has driven the rise in digital item markets, where the virtual item model has led to fast growth in the online games-related market. Asia/Pacific dominates the virtual good market and will continue to do so in the next future¹⁷.

When considering the effects of this evolution in the underlying business models on revenue distribution between the supply chain actors, two simultaneous processes have to be taken into account. On the one hand, there is the overall trend of transformation of digital products into services, which also involves online games, and on the other, there are the processes of disintermediation and re-intermediation, both of which affect the supply chain. A reduction in the importance of distributors and retailers has to be expected, while ISPs and portals are increasing their presence in the new evolving scenarios. The new challenges provide a good opportunity for publishers and developers to increase their revenue shares, which were, in the past, rather small especially for developers in Europe.

But these changes, represented by the vertical axes in Figure 2, have to be combined with what is expected to happen along the horizontal axes of the same figure. It is expected that an even bigger impact on revenue distribution will be brought about by the change in importance of revenue models. Retailing-based revenue models are shrinking as a result of the key role played

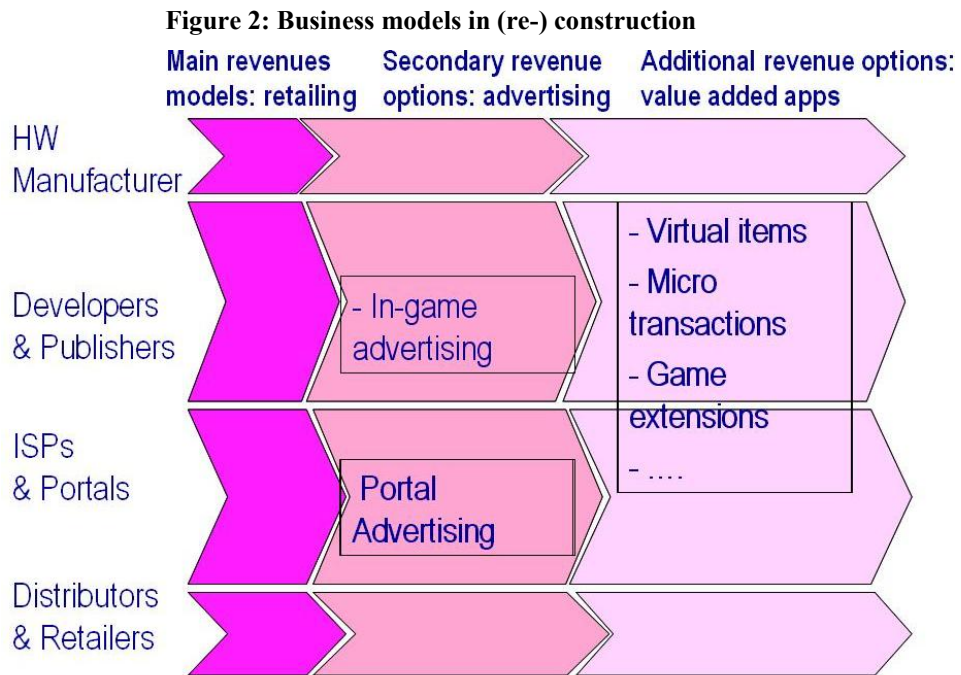
¹⁵ See the presentation "Consumer Trends in Virtual Goods and Downloadable Gaming in North America and Europe", available online at: www.dfcint.com.

¹⁶ Source:

http://www.deloitte.com/view/de_DE/de/branchen/article/5bcc6816ec574210VgnVCM100000ba42f00aRCRD.htm

¹⁷ Although with a slightly decreasing share by 2014 (61%) according to In-Stat (2011), at 50.

by the free-to-play (F2P) model. This change supports a strong increase in the adoption of additional revenue options based on value-added applications. These can include time-based billing for game subscriptions, event-based billing (subscribing to an event –music, video, etc.- through the game) or item-based billing (e.g. payment for an additional level or piece of weaponry on a game). Virtual items and game extension sales are expected to account for the biggest revenue share in a market ruled by micro-transactions, though some room is left for advertising. Advertising is a source of revenues but its formats are changing to become more compatible with the new distribution approaches (in-game advertising, portal advertising, etc.). The success of on line games, but of mobile games as well, is linked with the appearance of consolidated and scalable business models. However, it is not yet known which the most successful business models will be and when they will be in place.



Source: Author's own elaboration.

4. Toward e-services

On-line video games share the same destiny as many segments of the creative content industry, despite the distinctive features we have just described in previous sections. In fact, all multimedia content is undergoing a transformation from products into online services, and this evolution is affecting the organisation of production, the structure of revenues and the business models.

In the past few years, the distribution of online games has been progressively concentrated on internet portals serving the PC-based side (e.g., among many others, Valve's Steam Service or Manifesto Games), and on a few, very powerful, network platforms for console games, each controlled by the provider of the console hardware. In networks such as Xbox Live, Playstation Network and Wii Virtual Console, it is easy to recognise the gateway for online playing and games download of each of the three most successful console and handheld platform manufacturers.

Since then, independent applications stores have been growing rapidly,¹⁸ providing online games access to PC users together with the possibility to download games, but also movies, music, additional contents. In the same way, console-oriented gateways are also increasing their importance and audience by differentiating the type of content and services that they allow users to access. Starting as gateways for accessing video games, and related contents and communities, they are increasingly offering different kinds of digital contents and resources.¹⁹ This is pretty much in line with the process of digital convergence, already acknowledged in the literature (Screen Digest Ltd et al., 2006), which is based on digital distribution of different types of content and on the diffusion of interactive capabilities to the consumers. This phenomenon is not only affecting the video game industry, but also the movie, video and music industries, mobile communication and the whole publishing sector in general.

At the same time, game consoles have been equipped with optical disk players (DVD, Blu-ray), and multimedia facilities, and are thus converging towards home entertainment stations, where gateways play a key role as portals supplying every type of home entertainment and digital content. In this process, hardware providers hope to achieve the convergence of different home equipment into a single hardware platform by means of the evolution of gaming consoles. Gateways will be positioned as intermediaries between the providers of different kinds of contents and the users, adopting an integrated distribution system (building on already available and successful experiences like iTunes).

The major trends emerging over the last few years are connected to the evolution of software applications from products to services. Parallel to the this process, online games are integrating more and more digital content, and video games in general (with the exclusion of

¹⁸ E.g. in 2009 two browser-based game companies (Bigpoint, Gameforge) from Germany were among the five fastest growing IT companies in the country. Source:

http://www.deloitte.com/view/de_DE/de/branchen/article/5bcc6816ec574210VgnVCM100000ba42f00aRCRD.htm

¹⁹ The key dynamics of video games in general are described in a more general framework in Mateos-Garcia et al. (2008).

browser –based games making their competitive advantage out of their simplicity²⁰) are making efforts to improve realism even further.

Online games have a role in the digital content convergence process not only through the technological innovation they introduced but also with the growing interaction with other sub sectors of the media and content industries. The use of the game engine Havok (from the company Havok Dynamics SDK) in the production of the Matrix trilogy is an illustration of the former. The singer Lady Gaga and the game company Zynga announced Gagaville derived from Farmville as a way to promote the new CD of the singer. This is a good example of an hybrid business model as the CD can be downloaded for free when a customer is buying a 25 \$ game card²¹. Capitalizing on the astonishing success of the mobile game Angry Birds (12 millions copies sold and over 200 million downloads since the game was released on App Store in December 2009²²), the Finnish company Rovio Mobile is now developing the title through merchandising, films and TV series. This industry will play a major role in the move toward more immersive forms of entertainments enabled by the fast digital equipment of movie theatres²³ and the quick adoption of 3D screens: in the EU, 80% of the digital screens are 3D screens²⁴.

The diffusion of MMOGs together with the persistence of virtual gaming worlds give rise to the need for the development of new business models to match the increasingly massive and evolving demand. New sources of revenues have been identified and, at the same time, the persistence of virtual world and the need to adapt the online game's core to the decisions and behaviours of thousands, if not millions, of users has been pushing forward another process of evolution. Nowadays, online games are becoming more and more like services, provided by the publishers, rather than mere products, packaged and finished once deployment starts. Complex MMOGs, whose servers are always kept online,²⁵ need to be updated continuously by the publisher, and this trend is also beginning to apply progressively to simpler browser-based games.

²⁰ This might reflect another emerging trend in the economy: i.e. the "less-for-less" business models being tried out by multinationals like Nokia or Tata in India. The aim is to offer massive production of cheap basic-needs services to very large (poor) markets. The scale of the business makes its value.

²¹ www.cbsnews.com/8301-504943_162-20061638-10391715.html and www.zynga.com/ladygaga/ -

²² Source: Wikipedia, may 2011.

²³ 30% of EU's total screen base digital by the end of 2010, 40% for the USA. Source: MEDIA Salles, European Audiovisual Observatory, 2011.

²⁴ Over 50% in the USA. Source: MEDIA Salles, European Audiovisual Observatory, 2011.

²⁵ The game is played by a big number of users, who access at different moments and contribute in different ways to the development of the game's plot. Therefore, the "world" represented in the game must be always available (online). As a consequence, a server (or a number of servers) must be always connected and devoted to providing users with the "virtual world" they need to play.

Demand has been a driving force, pushing all multimedia content towards convergence. Consumer behaviour has also evolved over the past few years and has allowed the viral diffusion of online gaming to take place at an unexpected pace. This increasingly active role of users has been sustained, on the other hand, by the interactive and social nature of the online gaming experience. It is argued that user engagement has been largely pushed by the social aspects of interaction in multiplayer games, where communities of users play a big role and communications among them are mandatory. This is seen as a first step for users towards interaction with the game itself, to the creation of content. Events in a game's virtual world are influenced instantaneously by each player's actions, and the game itself never stops, but is continuously changed by users' actions. Nevertheless, this trend could take time to establish itself and we should be cautious about predicting the different paths it could follow and also about its potential impact on industry.

The growth in social network online gaming is pushing this trend even further, and user-provided content is starting to be a reality. Virtual worlds as "Second Life" keep expanding as broadband penetration grows and critical mass is achieved. Innovative business models, combined with the availability of tools and digital market places where user-created content can be exchanged, are supporting further expansion. The resulting User-Generated Games (UGG) in social networks are already popular with increasingly large numbers of users, who involve themselves in the creation of small games and other forms of entertainment within the context of existing online environments.

The exploitation of users' imagination and creativity is opening up brand new perspectives. This is contributing to the development of new content and thus supporting the extension of games life times. The possibility for users to generate content has been rapidly adopted, among other alternative content models, as a new way to do business. And due to the increasing importance of virtual communities connected to online games, it has become necessary to take them into account by considering them as complementary to the interactive content creation process. By the same token, mobile social computing allows interested actors to use social innovation as a new resource for providing more useful and cost-effective applications. New mobile techno-economic models take the user as consumer, creator of content and also a source of inspiration. For instance, in 2010 Sony Ericsson presented a platform called "Creation" which allows users and developers to co-create new content and tools using their mobile. In this framework, the distributor becomes more and more an aggregator of different types of content coming from different sources.

Mobile gaming is adding further opportunities to develop services. With regard to the use of context in gaming, context characteristics are typically derived from sensors, which capture both users' bio-parameters and their physical environment, and from cognitive technologies (Klemettinen, 2007). It is expected that the use of context will open up undiscovered needs and interactions. For instance, as mobile devices have rich sensing capabilities, they allow augmenting

the real world with the Internet (Griswold, 2007). The mobile device will be, then, the natural tool to bridge the physical world surrounding us with the wealth of information on the net and users will put the many situations of their real daily lives at the core of mobile usage. As an example of this future potential, users leave traces that can be used, anonymously and/or with privacy matters solved, as a way of gaming (Feijoo, 2012). For instance, location-based mobile games (LBMGs) are basically mobile games that use physical –mostly urban- spaces as the game scenario. Alien Revolt was the first Brazilian LBMG, released in 2005 by the company M1nd Corporation and the operator Oi in Rio de Janeiro²⁶. This example showed how limitations in available technologies (the game was played with 2.5G-3G mobile communications) and in affordable pricing can be partially overcome with the right user experience so as to allow new innovative services.

CONCLUSION

As shown in the previous sections, the value chain is undergoing some drastic changes. Some parts like the distribution part is vanishing away and taking new forms. The legacy value chain was dominated by two integrated models, a publisher-centred (development, IPR, publishing, distribution) one for the boxed products and a console-centred one with some overlapping and integration around the three main players. Under the trends described the landscape is getting far more complex with not only both dis-intermediation and re-intermediation taking place at the time but also with competing models brought by other players within or without the value chain

Observing this emerging trend - online gaming (but it mobile gaming is having a similar impact) (Feijoo, 2012) – points to the expansion of the video games industry in terms of supply-side actors (and issues), demand (across various demographic variables), technologies (and their accompanying technological and non-technological challenges, and business models (largely beyond advertising).

To sum it up the videogames software industry appears to be one of the most innovative labs for the coming Digital Economy: it is developing and experimenting new digital services (online, off-line and mobile) that manage to reach a growing share of the population. Born digital, the industry shows a digital growth that is taking advantage of many opportunities to offer user-friendly, intuitive services at a very large scale. Such services, mainly based on software development, are progressively invading other areas in the sector such as casual games,²⁷ advergames²⁸ or

²⁶ The game used Java-enabled cell phones equipped with location awareness to transform the city into a battlefield.

²⁷ Casual game: ease of use games (to learn, to access and to play) spanning all genres.

edutainment,²⁹ multiplying the supply-side actors. One might expect these quasi-experiments to offer essential core lessons to sectors such as eGovernment, eHealth, eCulture and eEducation, which are seen as more serious than games, but they have failed up until now to meet their targeted audiences with well adapted offers of e-services. Evolving from mere entertainment into virtual worlds, the online game segment is providing a marketplace for online economic activities (Wi, J H., 2009).

Service innovation now matters more than innovation in services as an engine for growth, as industrial value and supply chains are being reshaped. The video game sector can play a positive role.

²⁸ Advergames: a subset of the so-called serious games (i.e. allowing for other uses than entertainment), sponsored and distributed for free to advertise a product or an organisation.

²⁹ Edutainment: games with educational outcomes targeted at specific groups of learners.

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Displays,

RFID,

Robotics,

Video Games Software

Embedded Software in automotive

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