INTERNATIONAL BUSINESS PROJECT

Video Games Industry Overview

An Analysis of the Current Market and Future Growth Trends

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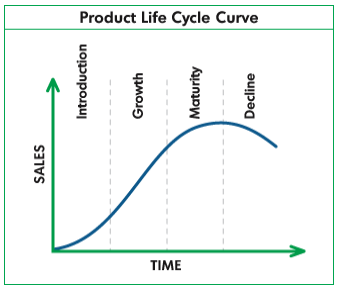
Abstract

The video games industry has undergone a total transformation in recent years. Gone are low technology games, inferior quality consoles, and disconnected users. The industry today is at the vanguard of technology and it appears infallible. Pricewaterhouse Coopers (PwC) predicts that it is poised for significant continuous growth in the coming years; projecting revenues to increase from $31.6 billion to $48.9 billion USD between now and 2011 (Scanlon, 2007). This is an annual compound revenue growth rate of 9.1% ranking the video games industry the 3rd fastest growing segment of the Entertainment and Media market (Pricewaterhouse Coopers, 2007). Within the industry home video game consoles stand out as a segment of great economic significance. Worldwide, sales of home consoles rose approximately double that of the annual compound growth rate for the entire industry at 18% or an estimated 74 million units from 2006 to 2007 (Datamonitor, 2008).



This industry is extremely competitive and companies wishing to compete globally must be highly in tune with national markets to survive (Porter, 1980). For instance, in many first world countries the core hardware and game software sectors are at differing levels of market maturity when compared with developing countries. In line with the 'Product Lifecycle Theory' whilst first world countries are now categorizing these sectors as 'mature', developing countries are now entering their growth phase (Daniels, Radebaugh, & Sullivan, 2009). Recognizing what stage of the life cycle a product, region, or demographic, can be categorized as is crucial to the success of a company because consumer preferences; profit margins; competition; and infrastructure will all differ (Porter, 1980).

The intention of this report is to explore, analyze, and critically evaluate this dynamic global industry.

Our Approach

We have broken our analysis of the video games industry into six distinct sections.

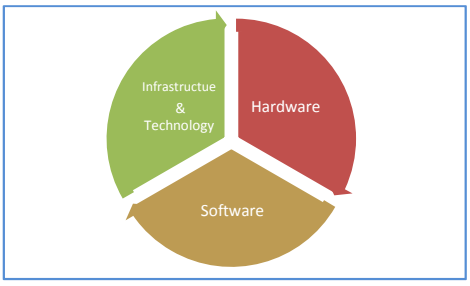
1. A broad overview of the industry where we have attempted to clearly defining what we perceive the video games industry to be. Furthermore we have given a discussion of its evolution in the hopes of conceptualizing how it has emerged today as a global industry giant.
2. A structural analysis of the industry has been made to explore the vertical integration that firms have along its different stages. This was done in an attempt to consider the broader strategic issues of integration versus using market transactions within this industry.
3. A strategic analysis of the main competitors was made along similar lines to Porters 5 forces model to try and convey the barriers to entry that firms face within the industry and the competitive forces they face with each other,
4. Growth of Online and Broadband technology was examined as this is seen as the next wave or emerging market which will fuel the video games industry in years to come.
5. Demographics or more specifically 'changing' demographics were then analyzed to illustrate the new markets that companies can exploit to increase their market shares.
6. Finally shifting industry trends were then considered as with changing demographics and a convergence of mature technology's new growth sectors emerge.

As an afterthought consideration we felt that whilst exploring the video games industry some attention should be paid to one of its greatest threats, digital piracy. As such the final section is devoted to this topic as an additional consideration.

Industry Definition

The Video Games industry develops, publishes, manufactures, distributes, and sells electronic gaming devices, software, and accessories. Traditionally the video games industry referred to gaming on 'raster' display devices where resolution was determined based on the number of pixels the image contained. However, with the development of more advanced technologies, such as the breakthrough of 3D polygon imagery pioneered by the Silicon Graphics Institute, it now refers to any type of display device (Lysenko, 2007).

The evolution of display advices has enabled an advancement of platform technology. Previously games were played from specific company's gaming systems, with television as their primary median; or on a personal computer, with software being uploaded. Today choices are endless as any interactive entertainment, computer, or electronic device that can manipulate a video display signal of a display device could potentially be used to play a game. Choices range from the aforementioned traditional platforms to more advanced platforms such as Mobile Phones, BlackBerry's, MP3 Players, and other handheld devices. Together all of the platforms identified can be categorized as the hardware of the computer games industry; they are the devices that the video game is physically played on.



The video games industry can be segmented into two additional sectors. Firstly the software sector, which constitutes the games themselves; and secondly the infrastructure and technology sector, which encompasses the support necessary to distribute and the improved technology offerings needed to play the games. Combined these three sectors make up the video games industry. Again within software sector there is a wide variety of scope of game offerings, such as but not limited to: First Person Shooter Games (FPS), Role Playing Games (RPG's), Mass Multiplayer Online Role Paying Games (MMORPG's), or Platform Level Games (PLG's). With so many game offerings catering to consumer preferences on a multitude of

platforms the infrastructure and technology sector is of obvious strategic importance to competitors within the industry and will be explored in greater detail throughout this report.

The Evolution of the Video Games Industry

Early History and the Market Crash

In 2005 Ralph Baer was awarded the National Medal of Technology by US President George W. Bush for his contributions to the Video Games. As an electronic engineer working as a defense contractor for the US Military in 1951 he first proposed the idea of linking a gaming element to televisions. At the time this seemed unfathomable and his idea fell on deaf ears. 15 years later however, in 1966, he rekindled his notion of a secondary usage for televisions and was given the opportunity to develop his idea. The following year, in 1967, Baer and his team of engineers developed the first interactive game that could be played on a television (Herman, Horwitz, Kent, & Miller, 2002). It took a further 5 years to work out all of the logistical difficulties of game playing but by 1972 the first home video game console, the Magnavox Odyssey, was unveiled to the public at a convention centre in California (Herman, Horwitz, Kent, & Miller, 2002). The Magnavox Odyssey was unquestionably the talk of the town. However, upon its release its high price of $100 USD and the general public's misconception that it could only run on a Magnavox TV, hurt sales considerably. Though it managed to sell close to 100,000 units in its first year of operations it eventually lost its competitive advantage as industry leader as other companies entered the market.

The following year, a start-up company founded by Nolan Bushnell, Atari, quickly gained pole position through its differentiated product offerings, such as sound, and its highly successful arcade game, a simple ball and paddle game, Pong. Following the success of Pong, more than 30 video games were released by 11 manufacturers between 1972 and 1974 to be played on Atari's console system. By 1976 the video games market was growing so quickly that it could not appease demand, which at that time was almost 60% greater than anticipated (Demand Overwhelms Video Game Makers, 1976). The video games market had exploded.

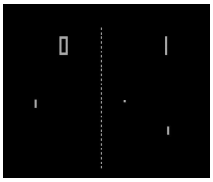
By 1983, sales in video games stood at nearly $3.2 billion USD, a more than 400% increase in sales revenue from the previous year (Player 3 Stage 6). Demand appeared insatiable and companies such as Atari, which at that stage enjoyed almost 2/3rd of the US market share, began cutting corners and offering subpar products in an attempt to meet it. The market became saturated with poor quality offerings and consumer indifference fostered by the lack of substantial improvements in product lines grew (Player 3 Stage 6). In 1984 the final nail in the fledging video games industry arose, the availability of low cost home computers. For the first time consumers had the option to purchase a computer, with superior technology, and for approximately the same price, as the latest video game. As sales fell in the video games market they rose substantially in the PC market. Combined, this arguably explains the 1984 market crash of the video games industry (Kent, 2001).

In 1985, Nintendo arose from the ashes of the market crash with its home video games console, the Nintendo Entertainment System (NES), and its video game Super Mario Brothers. Super Mario Brothers became an instant hit amongst consumers and 'almost single handedly revitalized the video game industry' (Nintendo) due to its high quality game play. This cemented the shift of consumer preferences from low to high quality game offerings. The industry responded, recognizing the need to continuously innovate, particularly to improve speed and graphics, in order to capture greater market share amongst consumers and compete with the growing home personal computer market.

Evolution of Technology – 1980's & 1990's

In 1985 Nintendo's NES had an 8 bit processor with 2kB of video RAM, however just 6 years later it had doubled its processor to 16 bits and increased its video RAM to 32 times that of its 1985 offering with video RAM of 64 kB's. This incredible growth supports the hypothesis made by Gordon Moore, co-founder of Intel. He famously proposed in his 1965 paper "Electronics" that 'the number of components on computer chips will double every eighteen months to two years' (Brock, D, 2006). Increasing the number of components on computer chips increases the storage capacity available to game makers. This in turn enables games to be longer and more complex, with higher sound and music quality. As can be seen below, graphical sophistication

also increases as a direct consequence of what has been dubbed 'Moore's Law' (The Technological Progression of Video Games, 2006).



1976, Atari

1986, NES

1996, PlayStation

2006, Xbox 360

Throughout the 1980's Nintendo dominated the video games industry, however as 1990 approached, it began to face competition from manufacturers who matched their 16 bit processor offering. By 1994 Nintendo's technology was surpassed with a 32 bit processor offering by Sony with their console the Playstation. Nintendo retaliated in 1996 with the Nintendo 64 but it became marginalized by the more advanced technology of Sony's Playstation 2 in 2000 and Microsoft's entrance into the market with the Xbox in 2001. This 'technological leapfrogging'[1] of Nintendo by Sony and Microsoft has had long-term repercussions, as since 2001 Nintendo has struggled to recover in this segment of the home console market (Keller & Kotler, 2006).

Nintendo Entertainment System	Super Nintendo Entertainment System	Sony PlayStation
1985 8-bit 2 MHz 2 kB RAM video RAM 2 kB 16 colour 128 kbs RAM	1991 16-bit 2,68—3,58 MHz 128 KB RAM video RAM 64KB	1994 32-bit RISC 33,87 MHz 2 MB RAM 360 K polygons/s CD-ROM
Nintendo 64	**Sony PS2**	**Microsoft Xbox**
1996 64-bit MIPS RISC (R4000 series) 93,75 MHz	2000 128-bit MIPS 294 MHz 38 MB RAM 66 M polygons/s DVD/CD-ROM Sony Graphics Synthesizer video RAM 8 MB	2001 733 MHz (Intel Pentium III) 64 MB SDRAM 8 GB HDD 125 M polygons/s DVD/CD-ROM 256 audio channels

This highlights the significance of lifecycles in product offerings. Each cycle introduced has incremental technological changes. To ensure market success companies must remain at the forefront of technological innovation or risk being made obsolete. In the structural and competitor analysis this notion will be evaluated in greater detail.

[1] Technology leapfrogging is seen as a bypass strategy and is practiced in high-tech industries whereby the challenger patiently researches and develops the next technology and launches an attack. Nintendo successfully applied this strategy directly after the market crash and then subsequently had it done to them by Sony and Playstation as described above.

Structural Analysis

'A structural analysis gives a framework for understanding the competitive forces operating in an industry that are crucial to developing competitive strategy' (Porter, 1980, p. 156). In the context of international business, examining industry's frameworks allows us to draw a clear picture between how firms position themselves in this rapidly globalizing world. Multinational corporations are the focal point of this examination as they retain the largest market shares within the video games industry. This section will explore them through firstly an analysis of the industry's vertical upstream and downstream markets; and secondly an analysis of the three largest manufacturers value chains.

Industry Structure

The video games industry is segmented firstly into 5 vertical stages: development, publishing, manufacturing, distributing, and retail; and secondly into two distinct arenas: software and hardware. In some respects can be seen as comparable to the book publishing industry as in both industry's some firms choose to integrate adjoining stages whilst others outsource, contract, or work collaboratively to maintain competitiveness (Williams, 2002). This section will examine the vertical integration decisions of firms in the industry to explore whether they choose to internalize transactions or use the market to achieve their economic purposes.

The Upstream Market

The upstream market is dominated by the manufacturing of hardware and development of software. The hardware manufacturing business consists of four different vendors: consoles, PCs, Online, and Mobile. In OECD countries, market shares are approximately 73%, 17%, 6% to 7%, and 3% to 4% respectively. Though the mobile market is quite small and relatively new, within OECD countries it is viewed as the market of the future (Vickery, 2005).

With a 73% market share the console market is highly significant. It is currently dominated by three manufacturers: Microsoft; Nintendo; and Sony. In 2007 Microsoft's Xbox360 was industry leader with 18.2 million units sold, followed by Nintendo's Wii with 18 million units sold, and finally Sony's PS3 with 10.3 million units sold (IT Facts, 2008). Interestingly manufactures target different market segments. Whereas Microsoft and Sony produce high-technology products for the traditional hard-core gamer, Nintendo's focus is less technologically advanced and targets more casual gamers. By the end of 2007, Wii was overtaking Xbox in market share and monthly unit sales (Sinclair, 2008)[2].

Software is developed primarily In-House, by Third Party Contractors, or Independents. (McDougall, 2007). In-House developers are owned directly by publishers and therefore usually have less autonomy but enjoy higher funding security than their counterparts. Consumers expectations of high-gloss, graphic intensive games, has seen the costs of developing a video game mushroom. Today for instance a Playstation 3 game costs on average $15 million to develop (O'Brien, 2006). Rising costs have forced a shift in this upstream market as Independent Developers are struggling financially to compete. Additionally, as Garage Games, one of the largest Independent developers, has noted, lack of access to an open platform or tool in console software development is also a considerable obstacle (Independent Game Developer's Conference, 2002). With developers struggling for financial backing and larger firms recognizing competitive advantages in the sole rights over top developers, this industry experiences high levels of mergers and acquisitions. The giant Microsoft is particularly active in this market. For instance, in 2001 it successfully acquired Rare, an In-House Developer, from Nintendo; and furthermore in 2006 it purchased Loinshead, a former Third Party Contractor (Microsoft, 2006).

[2] These manufacturer's strategies will be examined in greater detail in the competitor analysis.

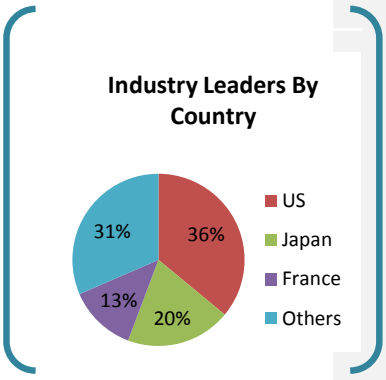
The Downstream Market

The downstream market begins at the distribution stage; again it is to be examined in terms of software and hardware offerings. In the software sector distribution to retailers is organized by publishers. Publishers must obtain a license for the rights to sell a game pertaining to a particular console and must pay the manufacturer royalties for each sold game. As such manufacturers must examine the optimal cost structure for their company to determine whether the costs/benefits of in-house publishers outweigh the costs/benefits of outsourcing to Independent or Third Party publishers.

Within the industry Microsoft has their own in-house publishers, Microsoft Game Studios and is therefore identified as the only player who integrates all three functions of software development, hardware manufacturing and publishing. In contrast Sony and Nintendo rely on independent publishers for distribution.

At the 2007 year end US based Electronic Arts was identified as the largest independent publisher by sales volume. In second was the Japanese company Konami, followed by US based Activision, French based Vivendi, US based Take-Two, and French based Ubisoft. In December 2007 Vivendi and Activision merged, creating a super publishing house able to compete with the dominant industry leader Electronic Arts (Nuttall, 2007).

Independent Publisher Global Market Analysis 2007		
	Sales Revenue in Billions USD	Market Share
Electronic Arts	$ 3,091	19.9%
Konami	$ 3,066	19.7%
Activision	$ 1,513	9.7%
Vivendi	$ 1,074	6.9%
Take-Two	$ 982	6.3%
Ubisoft	$ 908	5.8%
Others	$ 4,892	31.5%
Total	$ 15,526	100.0%
All data taken from web home page annual reports of companies		



In contrast to software, all hardware manufacturers organize their own distribution through local or regional subsidiaries which then pass their products on to retailers. These include pure video retailers[3] as well as supermarkets, toy specialists, discounters, department stores, direct sales and internet sales. Taking Ireland for example, supermarkets (34%), video retailers (28%) and toy specialists (14%) combined contribute to over 75% of distribution channels (Euromonitor International, 2006). With a 28% market share, pure video retailers such as large retail chains are highly important, however, small independent retailers also play a vital role.

To critically examine the software and hardware markets presented, consider that in 2003 software accounted for 57.5% of global retail sales compared with hardware sales of 42.5% (Euromonitor International, 2005). Growth in software is expected to continue to exceed that of hardware. To remain competitive hardware manufacturers should exploit all the opportunities available to them along their value chain and either increase their involvement, or form strong alliances, with the software sectors.

Regional Value Chain

There are three traditional core markets worldwide: North America, EMEA, and Asia Pacific. North America is the headquarters of Microsoft which is the largest IT Company in the world and is engaged in developing, manufacturing, licensing, and supporting of software products (Datamonitor, 2008). It is viewed with such importance that most developers and publishers maintain a presence in its IT hub, Silicon Valley. This therefore identifies strong upstream activities. Additionally, as the largest retail market in the world with a sales volume of US$ 19.6 billion in 2007, a worldwide market share of 37%, it possesses a strong market position and is an integral part of the complete value chain.

Europe achieves a strong downstream position, but is of minor importance in upstream activities. None of the big three console manufacturers are headquartered in this region, and

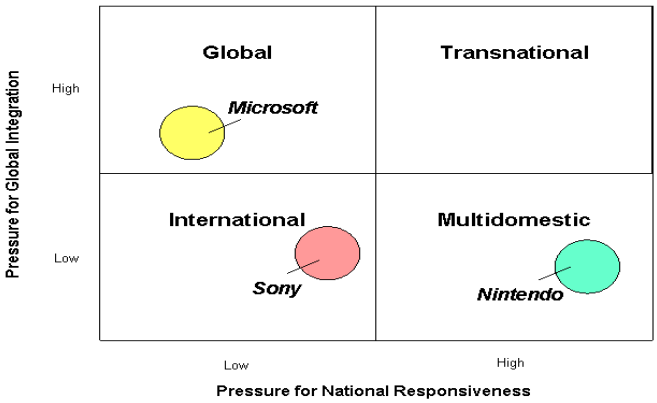
[3] Such as Best Buy, Circuit City, Dixons, or Wal-Mart.

only few developers, like Frances Vivendi, are present. However Geneva, in Switzerland, has established as a major hub for publishers with Activision Blizzard and Take-Two locating their publishing headquarters here (Geneva.ch, 2008). After North America, Europe is the second biggest video games consumer market with a market share of 34% and sales of US$ 18.1 billion in 2007 (Datamonitor, 2008).

The third core market, Asia Pacific, has Japan as its focal point. Japan houses two of the big three console manufacturers, Sony and Nintendo, thereby producing over 85% of the global console business. Additionally, Japan is also the home of a leading publisher, Konami, which concentrates mainly on its domestic market. This equates to a strong upstream and downstream market in Japan. In recent years however, the Japanese market has been in decline due to the rigorous sales of second-hand products, and upcoming markets like China, India and Vietnam may soon replace it as the focal point for Asia (Euromonitor International, 2005).With sales volumes of US$ 8.3 billion equating to a 16% market share, Asia Pacific is currently the third largest market in the world.

Global Value Chain Coordination – Microsoft, Sony, and Nintendo

The global value chain configurations of the three largest firms within the video games industry differ greatly. Through examination, it has been determined that they pursue different global strategies.



Microsoft

Microsoft displays activity along its entire value chain in both its software and hardware sectors. This intentional strategy of in-sourcing began in 2001, when Microsoft entered the console market. It is headquartered in the US but operates globally with a manufacturing plant

in Puerto Rico, an Operations and Logistics unit in Singapore, and, notably, maintains a presence in Dublin, Ireland, where it is active in licensing, manufacturing, operations and logistics (Euromonitor International, 2006). Through its tight control from its headquarters and its emphasis on the US American market, Microsoft's strategy is identified as global.

Microsoft's Global Reach

Location	Country	Activity
Domestic		
Redmond, Washington	US	Headquarters
Reno, Nevada	US	Licensing and Operations
World		
Humacao	Puerto Rico	Manufacturing
Dublin	Ireland	Licensing, manufacturing, operations and logistics
Singapore	Singapore	Operations and Logistics
Rivonia	South Africa	Regional Office
Reading	UK	Regional Office
Buenos Aires	Argentina	Regional Office
Quarry Bay	Hong Kong, China	Regional Office

Source: Euromonitor International

Sony

Sony is headquartered in Japan and operates strong subsidiaries in the USA and in Europe. Through these subsidiaries the group markets and distributes its Playstation family and related software (Datamonitor, 2008). The group operates in 204 countries across, North America, EMEA, and the Asian Pacific, therefore pursuing an international strategy (Figure 5). In contrast to Microsoft, Sony's focus is clearly on the downstream market. This is reflected by its choice to out-source its software development to third-party developers. Sony displays a higher level of national responsiveness compared to Microsoft due to this strategy as Third Part Developers are contracted from the regions it wishes to target.

Nintendo

Nintendo's production is headquartered in Japan, however it operates subsidiaries in the US, Canada, the UK, Spain, Germany, France, Italy, and Australia (Datamonitor, 2008). In contrast to Microsoft and Sony, Nintendo has a much larger console and software portfolio; targeting a

broader audience. It always has a particular regional market in consideration in its research and development. For instance the Wii Fit[4] was originally developed for the Japanese market and pure online gaming consoles were designed particularly for Europeans (Datamonitor, 2008). In terms of its Integration/ Responsiveness it can be categorized as adopting a multi-domestic approach. This approach is more customized than the strategy of its competitors. As such Nintendo's subsidiaries are vertically decentralized, possessing a great deal of autonomy so as to adapt to individual markets.

The ultimate test to assess whether a firm is global is its penetration level of markets across the globe. Many of the world's largest firms are not global but regionally based, in terms of breadth and depth of market coverage (Rugman & Verbeke, 2004). As per the Rugman and Verbeke Regionalization Model, Sony is classified as a truly global company; Microsoft is categorized as home-region oriented; and Nintendo, which sells over 50% of both its hardware and software in the USA, is categorized as host-region oriented.

[4] Nintendo's Wii Fit is a home fitness game. It will be discussed in great detail in the healthcare section of this report.

Strategic Analysis

Hardware

There are traits within the video games industry that firms should be aware of and use to their advantage. In the console market there are high barriers to entry through development costs, brand recognition, and product lifecycle innovations. In the software publishing market again there are high barriers to entry through development costs though brand recognition does not feature prominently and therefore doesn't provide a competitive advantage. However, game titles themselves carry great weighting with consumers and as such successful titles, such as FIFA, are often recurring.

Within the console market high costs are primarily associated with the research, development, and production, of new consoles. Establishing production economies of scale early in the product's life cycle is important when releasing a new console as manufacturers have the potential to recoup costs and begin profiting faster. Furthermore, significantly large sale volumes immediately after the products release helps establish production economies of scale and also contributes largely to the products brand recognition.

Strong brand recognition and establishing a wide customer pool both positively impact software and accessory sales. Additionally, successful hardware offerings incentivize Third Party's to develop software for the console. The PS2 is the best selling console to date with over 140 million units sold. Boasting over 9,000 compatible games for the system it could be concluded that its success is in part due to the wide variety of titles it offers gamers. Moreover, by diversifying title offerings hardware manufacturers can induce loyalty in a gaming community with them centering themselves around one console.

Currently, a common theme expressed by industry leaders Microsoft, Sony, and Nintendo, is to extend the product life cycle of consoles from 5 to 10 years. As it stands, consoles can take up to 3 years to break even and are then made obsolete 2 years after that. By lengthening the product life cycle of consoles, manufacturers hope to realize greater profits from hardware as well as from prolonged console related software sales. Sony has been most vocal about this

strategic shift aiming to extend the lifecycle of their most recent console, the PS3. It must be noted however that to extend a consoles lifecycle development costs may slow the production economies as well as induce a technological leapfrogging and time scale war amongst competitors. Additionally, research has shown that growth rates of the hardware business are cyclical, fluctuating with new product offerings. In 2003 the growth rate was down 6.4% from the previous year; however by 2007 growth had climbed by 18.0% (Datamonitor, 2008). This growth occurred in line with the 2006 launch of new generation consoles suggesting a positive correlation between sales growth and new hardware product offerings. Compounded annually the hardware market sustained an 8.5% growth rate between 2003 and 2007. In contrast the software business has predicted annual growth rates of about 15% until 2010 (Avakian, Carrese, Lewenberg, & Oliver, 2006) thus increasing its importance to the industry.

Software

The software publishing market also has high development cost barriers to entry. With the cost of game development exceeding that of Indie Movies there are high risks that initial investments will not be recouped should the game not succeed in the public's mind (ESA, 2008). This serves to ward off some potential entrants to the market as they do not have the necessary financial backing to sustain in the industry after prolonged failures.

Brand recognition of the publishing house is of less importance that with manufacturers of consoles, however brand recognition of game titles is enormous. If a game is successful it often spurs sequels as the risk of failure is greatly reduced. Moreover, as a publisher produces a series, logistical economies of scale and production economies of scale begin to have effects. Future games in a series therefore usually require less developmental costs. Though publishers brand recognition is generally minimal, two of the largest software publishers, Electronic Arts and Activision Blizzard, each have such a large portfolio of popular games that they are in a unique position for exploiting their brands publishing house as well as the game itself.

Company Strategy

Company's position themselves with consideration of the characteristics of a market and possible internal competitive advantages (Daniels, Radebaugh, & Sullivan, 2009). Some considerations they face are:

1. Degree of Specialization: the degree to which they should focus efforts in terms of the width of product lines, the target segments, and the geographical market served (Daniels, Radebaugh, & Sullivan, 2009).
2. Brand Identification: the degree to which they should seek brand identification rather than competition on price and other variables achieved via advertising, sales, etc.
3. Technological Leadership: the degree to which they can compete to produce technological innovations.
4. Cost Positioning: the sales strategy they should choose, such as low quality, low cost; or high quality, high cost.

Nintendo's Strategy

In the current generation of video game consoles Nintendo has released the Wii. Nintendo very boldly announced they would not be competing with Microsoft and Sony when releasing this console. The console incorporates low specialization in hardware but high specialization in software (Datamonitor, 2008). A new style of game play has been incorporated with fully motion sensing controllers, dubbed "wiimotes." Software is targeted towards a wide variety of ages and many markets. Nintendo recognized internal advantages of software development aimed at multi-player settings to be enjoyed by all age groups and certain niche markets. Furthermore, Nintendo successfully incorporated a low cost strategy that has helped to encourage massive unit sales. Released at $250 in North America making it the most affordable console of the three, the Wii has sold the most units today (Gruener, 2006). Perhaps more impressive the Wii is the only console of the generation to be sold above production cost at release. A potential threat arises further down the product life cycle as the consoles technical specifications lack compared to its competition. Although unlikely the standard for software

may become to complex for the system to perform, thus limiting software growth. Nintendo does develop much of its own software and publishes the popular titles *Wii Sports* and *Wii Fit*.

Potential opportunities arise in future software and accessories development. Nintendo has strong economies of scale in software production which developed over years in the market. This internal advantage has been a key factor in the success of the Nintendo.

Nintendo used the same strategy when producing a hand held system known as the Nintendo DS. This system has sold over 170 million units to date and is currently the market leader. Even with Nintendo's high market share and strong brand recognition threats in the hand held market appear more likely. This results from the convergence of portable media devices into one unit. Game software is available for alternatives such as cell phones. Nintendo's industry strength and strategy would be enough to overcome all for see able threats.

Sony's Strategy

The Playstation 3 or PS3 is Sony's latest edition to the console market. Prior to the release of the PS3 is the long standing production run of the PS2 which has sold 140 million units and is the best selling non-portable unit in history (Haley, 2008). The PS2 also has more compatible titles than any other system. When developing the PS3, Sony used a strategy similar to that of the PS2 launch. Meaning the PS3 is a highly specialized unit with advanced technical specifications. Game play focuses on elaborate models and graphic design combined with high functionality. Primarily the customer base consists of “hard-core” gamers and enthusiasts. This is partially a result of a market-skimming high retail cost of $599 for the standard PS3 and $499 for one with a smaller hard drive. Sony's brand recognition established in the console market from the PS2 generated a great deal of publicity and excitement around the PS3's release. However, its technological advancement led to high production costs initially and the production unit cost was approximately $840 around its release (Gruener, 2006). It's high cost also slowed growth and it became the slowest selling console. It wasn't until recently that Sony released a less expensive version and unit sales begin to grow more quickly. Of the consoles it seems the most prepared to successfully achieve a ten year product life cycle because of its

technical specifications, but the costs associated for Sony appear to be slowing the potential profit gain for Sony.

Opportunities exist for Sony be building a strong on-line community associated with game play. Furthermore, Sony's strong presence in developing markets will be beneficial if production costs are reduced greatly.

Sony also produces the hand held PSP. The PSP is Sony's answer to the Nintendo DS. One notable feature outside of gaming is digital media incorporation into the system. The PSP will also play movies sold by Sony Entertainment and pictures can be uploaded to the system through memory sticks. The PSP commands 28% of the market share (Altizer, 2005). Software development and movie releases are excellent areas for Sony to improve upon the console.

Microsoft's Strategy

The Xbox 360 is the predecessor to the Xbox and was released approximately one year prior to the PS3 and Wii. This early release allowed for sizable gain in market share. The console is highly specialized and currently there are four different models available which appeal to various levels of gamer at different costs. On release date the console retailed for $350 pricing it at mid range of the three consoles (Gruener, 2006). The system held technological leadership until the release of the PS3 and does not lack much in the area. The primary strengths of the Xbox 360 are potential customization and on line game play. A strong on line community developed through Xbox Live, a service which allows on line game play between consoles. Sales did slow when the Wii and PS3 were released but the Xbox 360 still holds the second largest amount of market share (Euromonitor International, 2008).

Microsoft entered the market with a high degree of brand recognition as a primary result from Windows operating system. Furthermore, the company still maintains the highest level of brand recognition on a global scale. This could be very beneficial to gain market share as new markets emerge. The company does fall however in its lack of a hand held video game system. This may be a result of windows mobile operating system which is the most common operating system for smart phones that appear to be the most direct competition for the hand held

market. Also, for such an early entrance into the market the Wii surpassed the Xbox 360 in market share rather quickly and growth is slowing (Euromonitor International, 2008).

One of Microsoft's largest opportunities is to incorporate game play between PC's and the Xbox 360 console. Many on-line games are supported on both the Xbox 360 and PCs. Integrating the two would strengthen the on-line community of Microsoft games. Also, Microsoft has a strong internal advantage in software development. This advantage could be used to reach out to a wider demographic that has thus far only been captured by the Wii.

Electronic Arts' Strategy

The two largest software publishing companies are Electronic Arts and Activision Blizzard. Software publishing for video games is a very tight market as 80% of the market share is controlled by the top 10 agents (ESA, 2008).

Electronic Arts commanded a market share of just under 20% in 2007, equating to a quarter of the market share enjoyed by the top ten publishers. To obtain such a market share the software publisher has acquired a portfolio of licenses and rights to games. These licenses allow them to reproduce popular games by updating or developing sequel games. Some of their most popular titles are Madden NFL, Command & Conquer, and more recently Rock Band. Growth for the company occurs through acquiring game developer companies or acquiring the licenses to successful titles. Primarily they use in house developers to develop these games but also employ a licensing system where they purchase licenses from independent developers to publish games. During the fiscal year 2008 Electronic Arts experienced 18.6% growth and $3.6 billion in sales (Electronic Arts, 2008). Recently, Electronic Arts has come across slow growth and underperformed their expectations for the 2009 fiscal year. This is primarily because of high costs and miscalculations in distribution estimations. As demand for a game must be met at release, it is crucial to properly estimate market demand for a title. If there is a shortage of a game, customers quickly lose interest and switch to substitute titles. To counter this slow growth they plan to further reduce costs by decreasing the size of their portfolio. During 2010 Electronic Arts plans to release a number of titles that are projected to sell extremely well. Overestimating demand can be less costly than underestimating as future sales may not be hurt

from a loss in customer dissatisfaction. Electronic Arts has a weakness in on line gaming. They also see a threat in the size of their portfolio at this point as games are becoming more expensive, and thus players are buying less games but more high quality games. Their largest threat is losing market share to the rising power house Activision Blizzard.

Activision Blizzard's Strategy

Activision and Vivendi Blizzard merged in December 2007, forming Activision Blizzard. The newly created company holds the second position for market leader with 18.3% market share after the merger (Nuttall, 2007). The merger of the company links two powerful forces of the video games industry Activision keeps an impressive portfolio of a few very strong titles while Blizzard has produced the best selling MMORPGs in history. By combining the impressive titles of the consoles industry with the unique ability of Blizzard's software development to produce best selling on line titles, the newly formed company is strong on all fronts of the industry.

Growth of Online, Broadband, and High Speed Internet Access

Worldwide a greater number of people have online access. Furthermore there is a strong increase in broadband / high-speed internet access. This implies that in years to come the reach of online gaming will continue to expand. Expectations forecast that "worldwide online game spending will grow to over $14 billion in 2012, up from $8 billion in 2008" (Haley, 2008).This ongoing network development presents multidimensional potential for the video game industry. If the old business model, where games are sold via retailers as tangible products or as downloads from the internet to be run or installed on the gaming devices, was rethought; the industry would switch to only offering online games this might be the key to dramatically increase revenues for many reasons.

To do so, would make digital piracy practically impossible (Haley, 2008). If games were no longer distributed to customers, but played online, then they cannot be distributed illegally. The only possible threat of digital piracy would from hackers actually breaking in to the company's server and steal the gaming software. As games can be programmed to run over a server, criminals would have to publish stolen programs on the internet. Therefore pirates were very easy to detect, making digital piracy a too risky business[5].

Players could be charged a one time or monthly / annual fee by the company offering the game in order to get access to playing the game. Ensuring everyone playing a game would have paid for its use. By charging periodical fees, such as monthly or annual fees for instance, game companies could also push profits per player. If players keep playing the game in the long run, periodical fees sum up to higher amounts than a onetime price for buying the game as we know it today. By introducing such a pricing model, of course, companies run the risk of losing revenues if players get bored by the game very soon and quit playing early. Nevertheless, online subscription fees are said to be "more stable than packaged goods revenues" (Haley, 2008).

[5] At least in theory assuming sufficient laws and law enforcement is in place

Furthermore offering games only online would change the retailing model in a favorite manner fort the video games industry. Retailers, who sell the games to customers today, were eliminated out of the supply chain. In effect, not only shipping costs were gone, but game companies would also no longer have to share revenues and profits with retailers, but could pocket the whole profit themselves. This gives game companies the chance to attract more and new customers by cutting game prices, while increasing their margins and therefore their profits per game, thus pushing overall profits to new dimension. As a side effect material costs for any physical media like CDs/DVDs as well as costs for packaging were cut to zero, increasing margins even further.

Online games also provide the chance to gain of new ways of advertising. On the one hand game companies could sell advertising space within the games to third parties. The ads could be tailored to a single player and a situation in the game context, like e.g. Google Ads are today. This would literally reduce wastage adverts to zero, making such a form of advertising very interesting for advertisers, thus providing game companies a valuable source to increase revenues. This implies that game companies have a good chance of gaining a recognizable share in the $40 billion online advertising market, for which annual growth rates of more than 20% are expected, with even higher growth rates expected for the in-game segment (Oliver Wyman, 2008).

On the other hand the games companies themselves were, for example, able to provide players a timely limited trial access to test new games. This could attract people to test a game who would normally not have bought it, thus increase the number of people playing a game, eventually pushing profits.

Game companies could also try and establish online portals providing a platform for online communities, attracting players of the relating game. With such a social network game companies might be able to increase customer loyalty and reduce fluctuation, which could positively affect long turn revenues. This hypothesis is supported by the fact that the social aspect of online gaming is an important issue for a significant share of people playing online games (Nielson Games, 2008). Furthermore “the increasing predominance of online forms of

communication and self-expression among younger age groups – whether through blogging, instant messaging or a variety of other means – and 2008's research data appears to suggest that video games are beginning to play an important role within this dynamic forum" (Nielson Games, 2008). This indicates immense potential for the video games industry to exploit online services in terms of increasing customer loyalty, attracting new customers and pushing revenues through such services and related advertising.

For this reasons we strongly recommend to switch the business model to only offer true online games in the future.

Current and Shifting Global Market Demographics

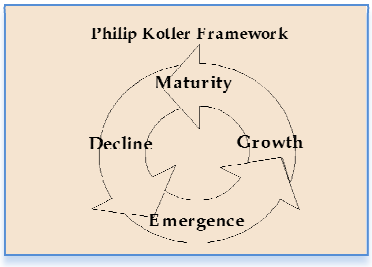
Due to vast technological improvements within the industry and the rise of the internet; today's gamers are all geographical backgrounds and ages, and female participation is on the rise. This section will evaluate where growth markets exist by analyzing the demographics of the video games market keeping in mind that recognizing shifts in key demographics allows companies to prepare for shifts in industry demand.

Geographical Demographics

As can be seen by the below graph, revenue growth rates differ considerably based on worldwide geographical regions[6]. The US represents the largest revenue market; however its growth rate is considerably less than the other regions identified. This is to be expected as the video games industry market in the US has been in existence longer than in the other regions and is therefore at the later stages of the industry cycle. Sales of video game consoles for instance have been saturated in the US with an estimated 45.7 million households in the US owning a home video console in 2006 (The Nielson Company, 2007).

Video Game Revenue Growth - By Geographical Region		
Region	Projected Compound Annual Rate as of 2006 (2006 - 2010 Figures)	Projected Compound Annual Rate as of 2007 (2007 - 2011 Figures)
US Market	8.90%	6.70%
Asia Pacific	12.30%	10%
EMEA	13%	10.20%
Latin America	9.50%	8.40%
Figures Taken From PwC's Entertainment and Media Reports 2006 & 2007		

[6] *Note*: EMEA includes EU15, Czech Republic; Hungary; Poland; Romania; Russia; Israel; Saudi Arabia; South Africa; and Turkey; Asia/Pacific includes Australia; China; Hong Kong, China; India; Indonesia; Japan; Malaysia; New Zealand; Pakistan; Philippines; Singapore; Korea; Chinese Taipei; and Thailand.



This equates to market penetration of 41.1%, categorizing the market as being in the maturity stage of its lifecycle within this region. However, as aforementioned, the video games industry is not solely driven by home consoles. As the home console market reaches maturity in the US other emerging markets are continuing to drive growth. For instance wireless and online gaming has been estimated as growing at a rate of 28.6%, which is more than quadruple that of the overall video game market for the US estimated by PwC in 2007 (Pricewaterhouse Coopers, 2007).

Analyzing the maturity level of markets can explain why other regions worldwide are currently enjoying such high levels of continuous growth. Though not in its infancy, home consoles as well as other platforms are all growth sectors for emerging market regions. This is due to increasing disposable income levels of consumers whereby, through the marginal propensity to consume[7], consumer tastes and preferences are changing to demand more luxury goods. Asia Pacific is emerging as a key driver of the industry for this reason. This is particularly prevalent in China and India where both countries have huge populations and relatively low media penetrations (Pricewaterhouse Coopers, 2007). The video games industry is poised to gain from an estimated additional 96 million multichannel households in these regions between 2007 and 2011. Additionally, wireless and online gaming is expected to grow at a rate of 23% (compounded annually) in this region, which is significantly above the overall gaming growth rate for this region, and further displays the move in demand from low to high end technology in this sector.

[7] The marginal propensity to consume refers to an increase in consumer spending that occurs as disposable income increases. With the increase in disposable income a consumer's propensity to consume moves along the consumption function. This is the famous proposition put for by Nobel Prize winning economist J. M. Keynes.

Age Demographics

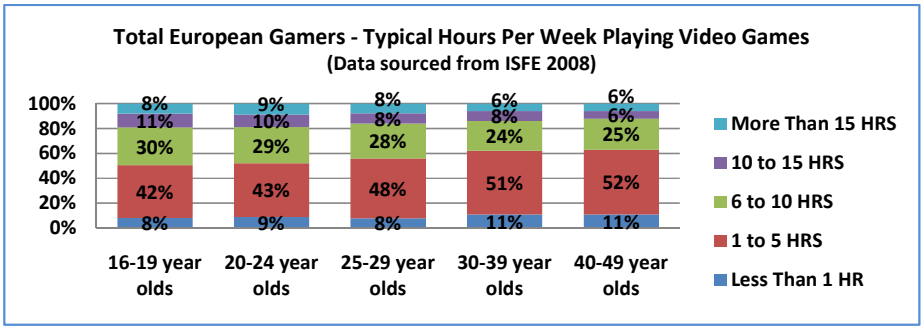
The video games industry today caters to a broadening demographic, which accounts for its

strong growth predictions for the coming 5 years. A common misconception amongst onlookers of the video games industry is that this industry's core customer base is today's youth. Researchers have been actively debunking this myth in recent years. According to the Entertainment Software Association (ESA), which surveys the demographics of the US Market, the average age of video game players in the US has increased year on year. The mean age of gamers currently stands at 35, up from the previous mean age of 33 in 2007 (ESA, 2008) and 29 just three years prior, in 2004 (Bryant & Vorderer, 2006). It is indisputable that in this market gamers are getting older; however the US is not unique in these trends[8].

Around the world as the population of many first world countries age, so too is there similar findings that the average age of video game players also increases. This does not however imply that the video game industry is failing to capture the younger generation; instead figures seem to imply that it is successfully retaining the previous generation as well as capturing today's youth. Where once there existed a generation gap between game players and non-game players, this gap is now rapidly closing. Video games are being viewed as an extension of traditional games as the world digitalizes and as traditional games have always maintained intergenerational appeal so too are video games. Studies support this statement, again reverting to the US Market, today 49% of video game players are between the ages of 18 to 49 years, whilst 25% are under 18, and an astonishing 26% are 50 years and above according the ESA (ESA, 2008)! Additionally the play time across generations is smoothing. A recent report by the Interactive Software Federation of Europe (ISFE), analyzing European gamers, has found

[8] For instance in Australia studies have shown that the average game player today is 30, up from 28 in 2007 and 24 in 2005 (Hill, 2008).

that there is very little disparity between hours of video game play across generations (Nielson Games, 2008)



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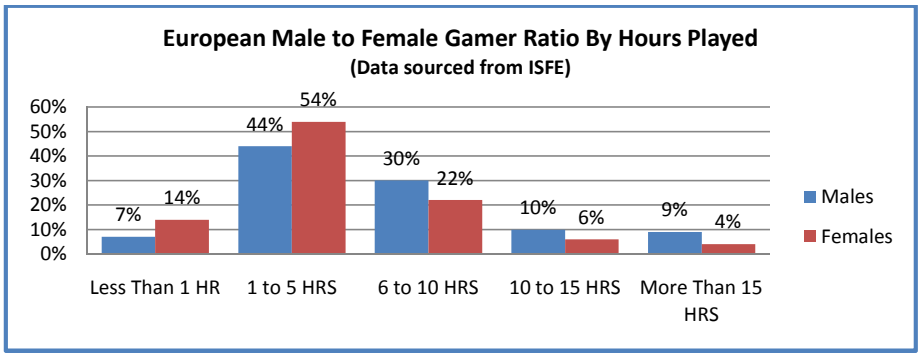
The implications of an increase in mean gamer age and the smoothing of play time across generations in first world counties is significant to a company's global strategy as it differentiates between the demographics of, and therefore identifies the need for differing approaches to, mature and emerging markets. Research into the age demographics in emerging markets is still limited; however, some studies have been conducted in China. There, age demographics as still skewed towards the younger generation, and it may still be some time before a China develops the sufficient level of market maturity necessary to witness this demographic shift. Currently the 19 to 30 year old age group dominates China's video games industry with an 84% market share, whilst the over 30 age bracket only accounts for 9% (Canadian Government, 2008).

Gender Demographics

Another industry misconception is that females are disinterested in game play and should therefore be considered a secondary market. Findings in mature markets have proven that game play is skewed towards males; however, the ratio of female to male players is on the rise. In 2007, the ESA found that 38% of gamers in the US market were female versus 62% male, yet by 2008 this ratio has been revised to 40% female and 60% male (ESA, 2008). The ESA's report also noted that women over the age of 18 currently represent nearly twice the gaming population of males

17 and younger and taking a narrow focus of the online and wireless gaming market, females account for 44% of gamers, an increase of 4% above the estimated amount of females in the total video games market.

Furthermore these gamers are categorized as 'casual gamers' meaning that they play 5 or less hours of games per week. The ISFE has had similar findings as well, noting that the female to male ratio of gamers playing under 5 hours of games per week is 68% to 51% respectively (Nielson Games, 2008). Whilst males still dominate play in the home console market, and play for longer durations than females, there is a rising market for female gamers that companies must address to stay competitive. Further in our analysis we will look more in depth as to how companies, such as Nintendo, are now cornering this highly lucrative emerging market trend.



Shifting Industry Trends

Technological change can happen in two forms, through incremental offerings whereby enhancements are made to increase customer value; and radical offerings, whereby a new proposal or additional features have been invented (Fitzsimmons, 2006). These radical changes are the only discernible source of competitive advantage and enable the emergence of new markets. Companies try to boost the technology within their markets and vis-a--vis become prisoners of the technology with which they compete; on the other hand, emerging companies may discover a new market through new technology.

To be a leader, the company must assume the process of transformation of the sector, recreate it and regenerate its strategy. Hamel and Prahalad list three points to create the future: changing the rules of engagement in an old industry, redefining the boundaries between sectors, and creating entirely new industries (such as Apple with the PC) (Hamel & Prahalad, 1996). For these authors, the ability to invent new sectors and reinvent existing ones is a prerequisite for being at the front of the industry in the future.

Technological Convergence

Technological convergence implies new business competition between previously unrelated industries and companies, as enterprises from formerly separate markets begin to simultaneously compete on the "converged market" due to shrinking market entry barriers. Thus, competition intensifies (Just & Stobbe, 2006).

Technical requirements imposed by customers are usually higher on converged markets as customers expect to get the best out of two or more formerly separate products. Furthermore, to succeed in the ever tougher competition, companies themselves seek to differentiate their products offering additional functionalities, services, or complementary contents to increase product attractiveness and to provide stronger arguments to buy a new product in saturated markets. This means that knowledge is a main success factor in converging markets. But a company's resources and core competencies, which are the main assets in competing on converging markets, are limited. To build up all the needed knowledge within a company takes time and money. Furthermore it can be of high risk to put all efforts into one technology that

might later on not succeed on the market[9]. Therefore strategic alliances seem to be a promising way of dealing with these challenges. Such alliances could not only provide knowledge transfer, but also tighten the value chain as they foster technical integration of different features in a product. Furthermore they could allow the development of new products or functionalities which were not possible if companies acted on their own. Types of alliances can range from loose and timely limited co-operations to horizontal integration strategies, depending on a company's resources and the aspired knowledge transfer and degree of technical integration (Just & Stobbe, 2006).

However, technical possibilities do not guarantee any success on the market. All depends on whether the customer is willing to buy and use convergent devices, which will most likely be the case if the new products are clearly better than existing ones. Furthermore products must be priced within customers' willingness to pay, which is usually very limited. Or in other words, most customers are not willing to pay a high premium for extended product features (Just & Stobbe, 2006).

Therefore a prerequisite for market success is an efficient value and supply chain. This could be achieved by, beside the aforementioned alliances, conducting a platform strategy. This means using the same technical basis for different products. The architecture of such products should be comprised of single modules, with every module providing a certain feature. Therefore all modules can be used for several products building on the same platform, reducing development costs per product (Tan, 2007). "Platform sharing mixes lower-volume 'differentiating' technologies to increase market attractiveness with higher-volume 'standardized' technologies to lower overall costs" (Brylawski, 1999). [10]

[9] E.g. The battle to become the new standard for high-definition optical discs between Sony's Blue Ray and Toshiba's HD-DVD, where the Blue Ray technology eventually succeeded

[10] For further insight please refer to: Simpson, Timothy W. et al. (2006) Platform-Based Design and Development: Current Trends and Needs in Industry, Proceedings of IDETC/CIE 2006, ASME 2006 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference, September 10-13, 2006, Philadelphia, Pennsylvania, USA.

For example, the video games industry could offer a basic mobile gaming device with online access and add various skin designs and functionalities like telephony, mp3-player, camera, GPS-navigation, etc., to attract customers with different expectations and willingness to pay. Furthermore this also provides the possibility of mass customization. Software developers could also gain of applying a platform strategy. In their case that could program software modules that can be used for creating different games building on one platform, thus levering the output of development efforts.

For all converged devices it is essential that the customer still sees them as gaming devices, providing additional features. This means that the industry still attracts its core customers, people seeking for entertainment as part of their lifestyles. If the video games industry fails to provide such converged products that provide additional value for the special target customer, its products are easily replaceable. Thus the video games industry would run a much higher risk of being substituted by other industries' products offering the same functionalities.

At the end of the day, if a product succeeds or not just depends on whether customer needs and wishes are met by the products on offer. Therefore we worked out possible converged products, providing additional customer benefits.

Console functionalities could be extended in a way that they not only offer gaming, but are a true "home media center" (HMC). Though such solutions failed earlier for several, mainly technical, reasons (Just & Stobbe, 2006), there could be huge potential for such devices as long as they offer the right functionalities and meet design expectations of modern living room entertainment devices. According to the National Institute on Media and the Family, with the acceleration of digital convergence "gaming will also become an increasingly integrated experience - combining social networking, mobile entertainment, and episodic downloadable content." To develop such a product that integrates a huge variety of features companies have

to analyze customer habits and practices correctly and have to consider and apply the findings in new product development (Just & Stobbe, 2006).

Besides gaming features such a HMC could include functionalities like stereo, DVD player and recorder, as well as online access, IP TV and IP video telephony [this could for the first time realize so called Triple Play - TV, online access and telephony from a single provider - on a large scale. A combination of all these features allowed the video games industry, for example, to offer video on demand in cooperation with the movie industry. This service so far largely failed, because most people do only have online access with their computers, which in most cases possess much smaller screens than TVs and are often located in the office instead of the living room, making watching movies on the computer less attractive. All this weaknesses were sorted out by deploying a HMC. Furthermore people would no longer have to go to a movie rental shop, but could select their favorite movie in a very convenient way right from their sofa, just a second before starting to watch it. This means the video games industry could take profit of the growing downloading- and streaming market.

HMCs also provide the gaming industry the chance to launch online radio programs that provide the benefit of no or low advertising breaks, but instead broadcast reviews of the latest video games to attract the audience to play these games.

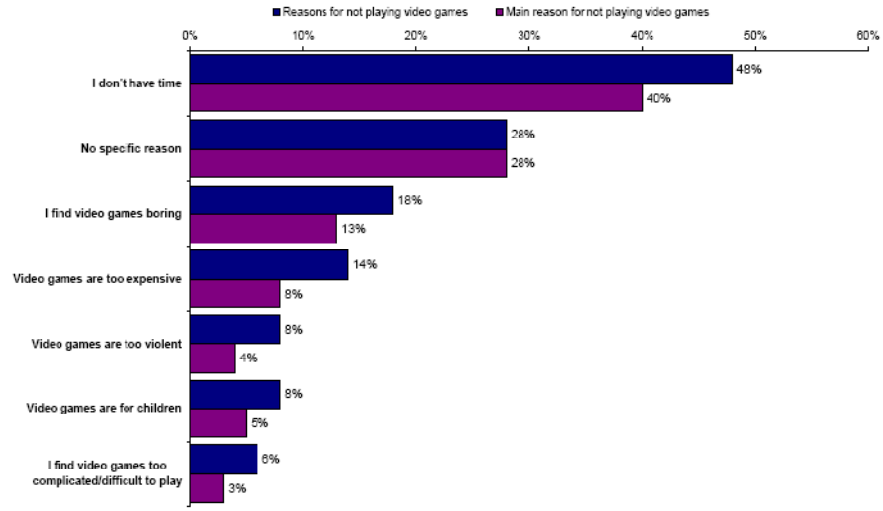
Mobile gaming devices might offer even greater potential to gain from technological convergence. As we see with mobile phones, which integrate functionalities like online access, email clients, cameras, mp3- player or radio, PDA functionalities, and even GPS navigation, customers highly appreciate converged mobile devices. To integrate some or all of such features in mobile gaming devices might broaden the customer base significantly by attracting new customer segments. Especially the ever higher up- and download capacities of mobile broadband, enabling new mobile multimedia services to offer good chances for the video

games industry as it provides diverse possibilities.[11] Furthermore Voice over IP (VoIP) is nowadays also practicable on mobile devices (Fogg, 2005). With offering that service the video games industry could offer a cheaper alternative to classic mobile telephony, which could attract completely new customer segments if mobile devices met the wishes of this customer segments. The huge potential of mobile games and videos is also indicated by estimates of Deutsche Bank Research, which forecasts double digit growth rates for the segment (Just & Stobbe, 2006). A further indicator for the huge potential of mobile gaming devices is the fact that most non-gamers report time-shortage to be the main factor for not playing video games (Nielson Games, 2008), which could be overcome by attractive mobile gaming devices and games that allow are built to be played in short time-spans.

► Reasons For Not Playing Video Games Among Non Gamers

Total European Non Gamers:

Why don't you play video games? And what is the main reason you don't play video games?
Base: Non gamers only (subsequently screened out of survey)

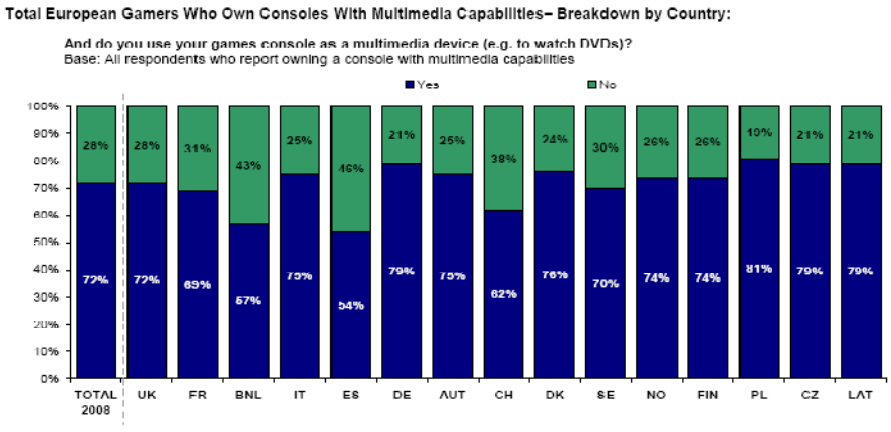


(Nielson Games, 2008)

[11] E.g. Creating more sophisticated mobile online games, linking classical online games to mobile devices, or building online communities around video games that are accessible everywhere.

So far stationary and mobile gaming devices are separate, unrelated products. But to exploit the full potential of technological convergence it might be feasible to join stationary and mobile gaming devices. For example, people leaving their homes and therefore their HMC could take with them a mobile device which enables them to going on playing the same game or listening to the same music while out of their homes. A closer relation of stationary and mobile devices could therefore increase hardware sales, as people were more likely to buy a stationary and a mobile device instead of just buying one of them. Furthermore it could increase the time a single customer uses the products of a video games company, thus providing the potential to capture a more important place in consumers' life and building a better customer relationship. The potential of the combination of mobile and stationary devices could be summed up in the following equation: combine console + mobile device = 360° entertainment + increased market penetration + higher profits.

Evidence for the huge potential of convergent products like the ones described above is given by the fact that "among those European gamers who report owning a multimedia capable console, over seven in ten (72%) say they use that device for broader media activities such as accessing the Internet, playing DVDs or listening to MP3's. This indicates that the games console is taking an increasingly broader role; not just in terms of games players but also in the use of game technology itself" (Nielson Games, 2008)



Multi Industry Growth Potentials

Firms competing in the games industry could leverage their core competencies by targeting relatively new niche markets in which generate added value for customers. In terms of market entry strategy, we suggest to use any form of cooperation a company established on the respective market. By doing so video games companies can gain from the established company's market know-how/knowledge and transfer the company's reputation to the newly introduced product(s).

As can be seen in the table below, there are various markets where features of video games are beginning to emerge. Below we will look the healthcare and education sectors in greater detail.

Growth Industry's For Video Games	
INDUSTRY	**GAME TECHNOLOGY USAGES**
Military	**Training soldiers and leaders in the tactics and strategies of war. Three dimensional modeling of equipment to illustrate or explore its capabilities**
Education	**Augmenting classroom instruction in nearly every subject – English, math, physics, history, etc.**
Emergency Management	**Training emergency responders, firefighters, FEMA agents, and others to deal with disasters.**
Corporate Training	**Orienting people to company products, facilities, and policies. Pilot and safety training**
Health Care	**Educating patients on treatments, rehabilitation, and managing anxieties. The next generation of workout videos.**
Movies & Television	**Alternative form of storytelling known as "machinima". Tools for creating animation**
Law	**Illustrate crime scene activities for judge and jury. Analyze crime scene data**
Data sourced from: Michael, D and Chen, S. (2005). Serious games: Games that educate, train, and inform. Thompson Publishing.	

(Chen, 2005)

Healthcare sector

Healthcare costs are predicted to rise faster than national income in the coming years due to a number of factors but most notably due to the aging population of most developed nations. Policy makers are struggling to secure the necessary finance to cope. With this in mind politicians, scientists, and researchers alike, are seeking ways to reduce the growth of

healthcare spending (National Bureau of Economic Research, 2006). This offers the video games industry a unique window of opportunity for new market growth.

Nintendo recognized this window earlier than most of its competitors and has positioned itself accordingly as market leader. As far back as 1993, for instance, Nintendo released its first diabetic super hero 'Captain Novolin' (Cravotta, 1993) who shot insulin instead of bad guys and battled sugary foods. The game was intended to educate young children about dealing with diabetics and was an instant success amongst youngsters as they found it easier to learn from Captain Novolin than from their family physicians (Cravotta, 1993); and amongst parents who reported a notable decrease in insulin emergencies with their children.

Upon examining this niche market today it is clear to see that Nintendo has firmly cemented itself as the video games console manufacturer of choice for the healthcare sector. In 2007, the Banner Samaritan Hospital in Arizona, USA, went so far as to conduct a study on the correlation between dexterity, precision, and video games usage, using their surgeons as test subjects. Participants were required to play the Nintendo Wii for one hour each evening and the results have been incredibly promising. After only 1 year, the elected surgeons scored on average 48% higher than their counterparts on tool control and performance evaluations (McNamara, 2008). The study has proved so successful that the hospital has created Wii stations, whereby controllers are placed further from the screen to simulate probes, so that surgeons can warm up prior to surgery.

Apart from the obvious practicality of this application of the Wii for training and improving the skills of healthcare professionals, the Nintendo Wii has also branched out with offerings for the general public as well. With its software, the "Wii Fit", Nintendo now offers home fitness regimes. Wii Fit teaches its users to become more aware of their bodies with Yoga, Strength Training, Aerobic and Balance exercises on a Balance Board that reads the users movements. This software is being adapted in family homes to combat obesity, nursing homes to combat the effects of old age, and rehabilitation centers as a replacement for physiotherapy (Wellsphere, 2007).

Though Nintendo is the recognized leader of this niche market, there are still many gaps in product offerings and therefore opportunities for competitors and new entrants to enter into and capture some of this market share. For example, Ben Duskin, a 10 year old leukemia survivor, appealed to the Make-A-Wish Foundation to help him design and manufacture a video game that could be targeted at children diagnosed with cancer. With the Make-A-Wish Foundations help and the help of LucasArts, in 2005 Ben's game was launched. He recognized that as a child entering hospital with cancer there were a lot of symptoms he didn't know he'd experience, and medications that he had to familiarize himself to. Furthermore he felt that a positive attitude was pivotal to his recovery and wanted to instill this in others. This is just one example; however, it clearly demonstrates that there are many still uncharted uses of, and therefore growth for, video games within the healthcare sector.

'Educainment'

While educational gaming has existed for some time for the PC, it has only recently broken into the realm of console gaming. While games had become mentally demanding, console gaming had yet to (successfully) target the educational gaming market. Of late, with the advent of Nintendo's latest gaming consoles, there are now games that focus on education for children and adults alike.

Nintendo's two main consoles, the infamous Wii and the portable Nintendo DS have the largest educational gaming libraries on the market. While the Nintendo Wii is rapidly accumulating its educational library, the DS must be identified as its core competency as it is at the forefront of educational gaming. Games like Big Brain Academy and My Word Coach are both games that were modified for the Wii, but the personal, portable nature of the Nintendo DS allows for more efficient learning methods. The console features two screens, one of which is a touchscreen with stylus, which allows the player to draw or write in answers in various games. While games like Big Brain Academy, Brain Age, Mega Brain Boost and My Word Coach focus on more explicit brain training, other titles like Professor Layton and the Curious Village incorporate mystery and adventure game play into puzzles and problem solving. Adults who never thought "gaming" could be for them are picking up Brain Age or Sudoku games to keep

their brains active on the go. Games have also been created for younger enthusiasts to foster early learning and creativity.

Nintendo's focus on families and educational gaming has drastically changed their consumer population by creating products for the casual gamer looking for a new way to learn. Those skeptics of gaming as a vehicle for innovative learning are now picking up controllers. Videogames are finally being seen as potential catalysts for educational growth and are managing to subvert the notorious couch potato stereotypes by making learning innovative and fun, while incorporating educational fundamentals.

Nintendo's advancement in this sector is of tremendous benefit to the video games industry as a whole as it has opened up a new avenue for growth within the console market. Nevertheless competitors must be careful not to discount the important strategic advantage of early entrance into this market. If Nintendo continues without challenge in this industry it will become synonymous with learning and competitors will find it difficult to overcome this brand recognition barrier to entry. Sony's recognition of this is evident with its latest game Buzz Brain Bender for the PSP.

Additional Industry Considerations

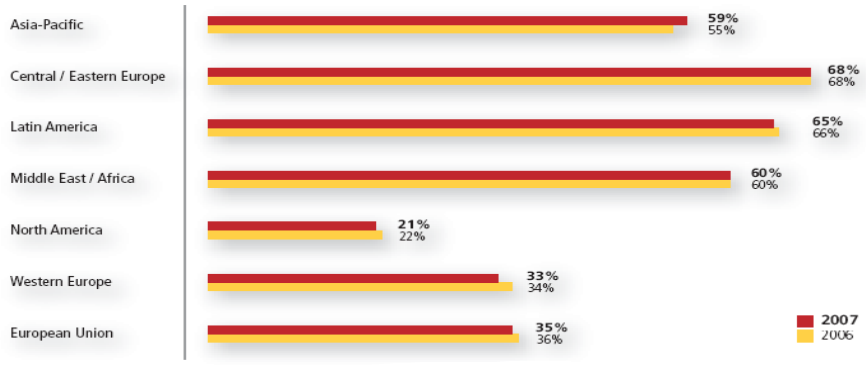
Intellectual Property Rights Infringement and Digital Piracy

Creative ideas, innovative expertise, and or intangible insights, which constitute a competitive advantage is referred to as 'intellectual property'. It is the result of intellectual effort and can therefore be protected by intellectual property rights (IPR), which are, for example, manifested in copyrights, patents, trademarks, and trade secrets, resulting of writing, inventions, identifiers, and processes, respectively. Intellectual property rights guarantee their owner control over, and enables them to derive benefits from, assets (Daniels, Radebaugh, & Sullivan, 2009). Unfortunately IPR's are not always respected and in some cases have been violated to a large extent. In terms of video games the infringement of these rights, resulting from unauthorized or illegal copying and/or distribution of video games for personal or business use[12], is called digital or software piracy.

End-user piracy, copying software without appropriate licensing; internet piracy, downloading unauthorized software copies; counterfeiting, creating illegal copies of software, registration cards, or serial numbers; and online auction piracy, offering unauthorized resale of software or auction off counterfeit or unlawful obtained software; are the most prevalent forms of digital piracy faced by the video games industry today (Microsoft Corp., 2008). The diagram below shows overall digital piracy rates by region[13]

[12] E.g. done by copying, downloading, sharing, selling, or installing multiple copies of a game

[13] Regions are exclusive apart from the European Union which comprises countries in Western Europe and Central / Eastern Europe



[Source: Business Software Alliance (BSA) (2007) Fifth Annual BSA and IDC Global Software Piracy Study]

Piracy rates tend to be lowest amongst large enterprises, but relatively high among private users (Business Software Alliance, 2007). As video games are mainly used in the private sector, it could be argued that video game related piracy rates should be even higher than findings have shown. Though no formal figures accurately predict the damage caused by digital piracy against the video games industry, it is commonly accepted that the damage could be highly detrimental. This is evident by the antipiracy measures taken by industry associations like, for example, the Entertainment and Leisure Software Publishers Association (ELSPA). [Compare ELSPA (2008) The ELSPA IP Crime Unit and what we do, at http://www.elspa.com/?t=antipiracyunit (accessed November 22, 2008)].

Comment [VAC1]: Is this a reference? This doesn't feel like a complete thought, was there more involved?

Anti Piracy Measures

As the video games industry can hardly gain revenues out of digital piracy in the long run like other software companies can, it should try and establish effective measures against digital piracy (Davis, 2007) (Hunt, 2007). We suggest that some of the measures established so far should be continued and intensified as they proved highly effective. Such measures include lobbying towards governments and international organizations like the World Trade Organization (WTO) or the World Intellectual Property Organization (WIPO) aiming to establish sufficient IPR laws, adequate penalties for infringement, and - maybe even more important - proper enforcement of these laws. To establish effective, consistent legislation, tougher trade

agreements and enforcement of these it is furthermore necessary to push politics towards increasing international cooperation.

Public education campaigns run by industry associations, sometimes in cooperation with governments, are also an effective tool in the fight against digital piracy. These campaigns are run increase awareness among private people and businesses about what digital piracy is, that it is a serious, penalized crime, which in effect leads to higher compliance rates.

Other measures taken by single companies and industry associations are deploying search engines that search the internet for installed pirated software and websites offering/distributing pirated software as well as hiring investigators, e.g. former policemen, to detect IPR infringement.

Furthermore technical measures like the use of holograms, registration numbers, passwords, certificates of authenticity or anti copying mechanisms integrated in the games seem to decrease piracy rates.

Though the above mentioned measures make digital piracy more difficult and risky, they only reduce piracy rates by, but could not win the fight against piracy at all. Thus, as indicated above, we strongly recommend switching to only providing online games in the medium-term in order to win this long lasting fight and end piracy of video games.

Conclusion

In conclusion we have conveyed that the video games industry is indeed global, spawning the world with its product offerings. As with any industry there is the existence of threats, such as technological convergence or the piracy threat we have mentioned above. However this is an industry which has had exponential growth since its inception and all reputable analysts predict that this will continue for the foreseeable future. The profitable nature of this industry makes it particularly attractive to firms and they are constantly pushing themselves and the industry as a whole to come up with radical technological offerings. With these increasing technological advances and the technological convergence of certain products, companies are competing for market share like never before. Today they are leveraging their core competencies to attract new customers and market segments as well as to enter completely new markets.

Bibliography

Brock, D. (2006). *Understanding Moore's Law.* Philidelphia: 2006.

Bryant, J., & Vorderer, P. (2006). Playing Video Games: Motives, Responses, and Consequences. Portland: Powells.

Brylawski, M. (1999). Uncommon Knowledge: Automotive Platform Sharing's Potential Impact on Advanced Technologies. Detroit: Hypercar, Inc.

Business Software Alliance. (2007). *Fifth Annual BSA and IDC Global Software Piracy Study.* Retrieved November 22, 2008, from Global BSA ORG: http://global.bsa.org/idcglobalstudy2007/studies/2007_global_piracy_study.pdf

Canadian Government. (2008). *The Chinese Video Game Market: Market Entry for Canadian Firms.* Retrieved November 15, 2008, from Canadian Government - International Trade - Trade Routes - China: http://www.pch.gc.ca/progs/ac-ca/progs/rc-tr/pubs/chin_vid/2_e.cfm

Cravotta, D. (1993, December). *Nintendo Healthcare.* Retrieved December 2, 2008, from Wired: http://www.wired.com/wired/archive/1.06/eword.html?pg=11

Daniels, J., Radebaugh, L., & Sullivan, D. (2009). *International Business: Environments nd Operations* (12th ed.). N.J.: Pearson/Prentice Hall.

Datamonitor. (2008, August). *Global Games Consoles: Industry Profile.* Retrieved from Datamonitor.

Davis, N. (2007, February 5). *Thanks For Letting Us Pirate.* Retrieved November 22, 2008, from APC Magazine: http://apcmag.com/thanks_for_letting_us_pirate.htm

Deloitte Touche Tohmatsu. (2004). *Moore's Law and Electronic Games: How technology advances will take electronic games everywhere.* Retrieved November 27, 2008, from Deloitte: http://www.deloitte.com/dtt/cda/doc/content/dtt_tmt_moores_law_0504.pdf

Demand Overwhelms Video Game Makers. (1976, November 29). *Business Week* , p. 31.

ESA. (2008). *Essential Facts About The Computer and Video Game Industry 2008.* Retrieved November 21, 2008, from Entertainment Software Association: http://www.theesa.com/facts/pdfs/ESA_EF_2008.pdf

Euromonitor International. (2008, October 23). *Toys and Games.*

(2007, October 5). Retrieved December 1, 2008, from Infoweek: http://www.informationweek.com/news/personal_tech/showArticle.jhtml?articleID=202300018

Fogg, I. (2005). How The Internet Killed The Phone Business. *The Economist* , 11.

Haley, R. (2008). *Video Games: The Cycle Plays On.* New York: Gabelli & Company Inc.

Herman, L., Horwitz, J., Kent, S., & Miller, S. (2002). *The History Of Video Games.* Retrieved November 27, 2008, from Gamespot: http://gamespot.com/gamespot/features/video/hov/index.html

Hill, J. (2008, October 29). *Screen Play: We're Getting Older.* Retrieved November 14, 2008, from The Age: http://blogs.theage.com.au/screenplay/archives//010913.html

Hunt, K. (2007, November 27). *Don't Fear The Pirates.* Retrieved November 22, 2008, from The Globe and Mail: http://www.theglobeandmail.com

Just, T., & Stobbe, A. (2006). *IT, Telekom & Neue Medien: Am Beginn der technologischen Konvergenz.* Retrieved November 24, 2008, from Deutsche Bank Research: http://www.dbresearch.com/servlet/reweb2.ReWEB?addmenu=false&document=PROD0000000000197269&rdLeftMargin=10&rdShowArchivedDocus=true&rwdspl=0&rwframe=1&rwnode=DBR_INTERNET_EN-PROD$NAVIGATION&rwobj=ReDisplay.Start.class&rwsite=DBR_INTERNET_EN-PROD

Keller, K., & Kotler, P. (2006). *Marketing Management* (13th International Edition ed.). New Jersey: Pearson Education Inc.

Kent, S. (2001). The Ultimate History of Video Games: From Pong to Pokemon--the Story behind the Craze That Touched Our Lives and Changed the World. California: Prima Communications, Inc.

Lysenko, M. (2007). *The GPGPU Creation Story.* Retrieved December 1, 2008, from University of Wisconsin-Madison: sbel.wisc.edu/Courses/ME964/2008/LectureByLecture/me964Oct23.ppt

McNamara, P. (2008, August 7). *Why A Wii Could Be Good For Your Health.* Retrieved December 4, 2008, from The Guardian: http://www.guardian.co.uk/technology/2008/aug/07/research.games?gusrc=rss&feed=science

Microsoft Corp. (2008). *Piracy Basics.* Retrieved November 22, 2008, from Microsoft Corporation: www.microsoft.com/canada/sam/piracy/default.mspx

National Bureau of Economic Research. (2006). *Health Care Expenditures in the OECD.* Retrieved November 27, 2008, from National Bureau of Economic Research: http://www.nber.org/aginghealth/winter06/w11833.html

Nielson Games. (2008, April). *Video Gamers in Europe – 2008.* Retrieved December 2, 2008, from ISFE Consumer Research: http://www.isfe.eu

Nintendo. (n.d.). Retrieved November 27, 2008, from Corporate Information - Company History: www.nintendo.com

Oliver Wyman. (2008). Communications, Media, and Technology 2008, State of the Industry. 13.

Player 3 Stage 6. (n.d.). *The Great Videogame Crash*. Retrieved December 1, 2008, from The Dot Eaters: http://www.thedoteaters.com/p3_stage6.php

Porter, M. (1980). Competitive Strategy: Techniques for analyzing industries and competitors. New York: Free Press.

Pricewaterhouse Coopers. (2007). *Global Entertainment and Media Outlook: 2007-2011.* Pricewaterhouse Coopers.

Scanlon, J. (2007, August 13). *The Video Game Industry Outlook: $31.6 Billion and Growing.* Retrieved November 27, 2008, from Business Week: www.businessweek.com

Tan, P. (2007, March 13). *Volkswagen To Adopt Audi's MLP Platform Strategy.* Retrieved November 26, 2008, from Paul Tan: http://paultan.org/archives/2007/03/13/volkswagen-to-adopt-audis-mlp-platform-strategy

The Henry J. Kaiser Family Foundation. (2006). *Snapshot: Health Care Costs, Comparing Projected Growth in Health Care Expenditures and the Economy.* Retrieved November 27, 2008, from The Henry J. Kaiser Family Foundation: http://www.kff.org/insurance/snapshot/chcm050206oth2.cfm

The Nielson Company. (2007). *The State of the Console: Video Game Console Usage USA 4th Quarter 2006.* Retrieved December 1, 2008, from Neilson Media: http://www.nielsenmedia.com/nc/nmr_static/docs/Nielsen_Report_State_Console_03507.pdf

The Technological Progression of Video Games. (2006, January 26). Retrieved November 30, 2008, from The Futurist: http://www.singularity2050.com/2006/01/the_technologic.html

Wellsphere. (2007). *Wii habilitation*. Retrieved December 5, 2008, from Wellsphere: http://stanford.wellsphere.com/externalView.s?evType=Video&evHeight=280&evParent=%2fvideoSort.s%3fsearchTerm%3dWii%2bHealth&evTarget=http%3a%2f%2fwww.youtube.com%2fv%2fM4dZFGDJAH4%26fs%3d1%26hl%3den%26source%3duds%26autoplay%3d1&evTitle=nintendo+wii+healt