

Theory and Evidence

**PLAYING THE GAME :**

Hardware manufacturers and software publishers'  
playing-to-win strategies within the video game industry

by

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## **Abstract**

This paper presents an overview and analysis of the explosive growth and evolution of the home video game industry over successive generations of hardware consoles. The analytical tools of Game Theory, 'Value Nets' and 'Added Value,' are used to examine the duality of both the complementary and the competitive aspects of the relationships between video game hardware (console) manufacturers and third-party software publishers. This research has chronicled the emergence of the third-party publishers from an essentially underappreciated commodity in the 8-bit generation to an industry-leading powerhouse on near-equal footing with the hardware manufacturers in the current 128-bit generation.

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# 1. Introduction

From its nascent roots of Fairchild and Atari, to the current powerhouse triad of Sony, Nintendo, and Microsoft, the home video game industry has witnessed tremendous growth and change since its inception. While the industry has adroitly adapted its structure and strategies in order to maintain its well-being and profitability, the players, rules, and scope of the industry have shifted. For instance, the competitive landscape of the video game industry has evolved from a virtual monopoly to an oligopoly. This in and of itself has had dramatic impacts on the way the game is played and how the players interact.

This paper will examine the duality of both the complementary and the competitive aspects of the relationships between video game hardware (console) manufacturers and third-party software publishers within the video game industry. Although oftentimes a firm is thought of as either strictly taking on the role of a “competitor” or a “complementor” (enhancer of value), this paper will reveal that these roles and their attributes are not necessarily mutually exclusive. It will present evidence to support this theme by citing a changing competitive dynamic among the traditionally dominant hardware manufacturers and the recently empowered software publishers. This paper will examine the shifting interdependencies between these players in the video game industry, such as an equalization of deal-making leverage for third-party publishers, soaring software development costs, and consolidation among software publishing houses. These changes in the dynamics of the industry stem from factors such as increased competition among the console manufacturers, tremendous technological advances in hardware and software development, and the reliance on big-hit gaming titles in the video game consumer market.

The scope of this paper will be limited to specific indications of the increasingly competitive dynamics between the console manufacturers and software publishers. It will shy

away from historical perspectives, technical development issues, and/or cultural/societal aspects of the video game industry. This paper represents an overview of the components of the video game industry and a brief analysis of the interactions between console manufacturers and software publishers.

Additionally, this paper will use Game Theory's analytical tools of 'Value Nets' and 'Added Value' in order to uncover the theoretical and economical implications of these trends to the video game industry and its players. *Sections 4.1-4.3* will introduce Game Theory's analytical tools and discuss their applicability to the video game industry. *Sections 4.4-4.8* will then utilize these theoretical tools while closely examining the interactions and relationships between hardware manufacturers and software publishers in each of the four recently-past generations of video game consoles (spanning from 1985 to 2005). First, however, *Section 2* and *Sections 3-3.3* will lay the foundation of the video game industry by answering the questions what are video games, who are the players involved, and how does the industry work. Overall, this paper serves as an as introduction to the dynamics of the video game industry and the interactions between the concurrently complementary as well as competitive hardware and software producers.

## **2. What are video games?**

From stand-alone coin-operated arcade games, to home video console devices, to handheld multimedia centers for entertainment—the video game industry involves the development, production, distribution, and ultimate sale of video game hardware and software.

Simply defined, video games are a form of interactive computer-controlled entertainment in which players interact with a virtual world in order to achieve a certain goal. This paper will

be focusing solely on the home video game market (*i.e.*, we are excluding stand-alone arcade games, PC games, handheld video game devices, etc.).

A home video game system primarily consists of a gaming console, controllers (used to interact with the game), audio and video output (usually a television screen), and video game software. The video game console is essentially a proprietary central microprocessor-based computer optimized for graphics processing capabilities.<sup>1</sup> Video game consoles have made tremendous progress in terms of processing power, storage capacity, and ancillary capabilities (such as network bandwidth connectivity) since their introduction to the public market in the 1970's. (*Exhibit 1* in **Appendix A** illustrates selective technical advances of video game consoles.) The first home video game system was commercially released in 1972 with no central processing unit or memory, and relied on plastic overlays that attached onto the gamer's TV screen in order to provide background graphics.<sup>2</sup> The system did not even have enough power to keep track of a player's score. In contrast, today's video game consoles possess high-powered microprocessors (as powerful as those used in PCs), hard drive memory storage, and are designed to play games, view movies, listen to music, connect to the internet, and essentially serve as versatile multi-media entertainment hubs.

Despite the technological advancements of video game consoles, gaming *software* is oftentimes credited with truly attracting consumers' attention (and dollars). Generally software designed for a specific hardware platform is not compatible for gameplay on any other system. This leads to a dilemma for console manufacturers because many consumers are not willing to simply abandon their collected library of software for one system in order to purchase a new incompatible system (and the new system's own uniquely compatible software). However, there are exceptions to this rule. In some instances hardware or software is developed that provides

console compatibility with software designed for other game systems. This is known as “system/platform compatibility.”<sup>3</sup> In other cases, hardware manufacturers must decide whether to allow the current generation console to be compatible with games from an earlier system from the same manufacturer (via either in-system components or peripheral devices). Although such “backwards compatibility” would provide an instant library of games to the consumer, it also usually dramatically increases the production costs for the manufacturer.<sup>4</sup> Additionally, if a console system is backwards compatible, software publishers are pressured to develop games for the new system that possess significant technologically advanced and attention-grabbing gameplay in order to ensure that consumers will purchase the new software, rather than remain content with the old system’s games. Compatibility issues are just one of the many strategic decisions that hardware manufacturers and software publishers must grapple with as they develop and launch new hardware platforms.

### **3. Who are the ‘players’ in the video game industry?**

#### ***3.1 Hardware Manufacturers***

Video game hardware manufacturers (or platform providers)<sup>a</sup> manufacture, market, and distribute gaming consoles. Historically, the video game market can sustain only two to three economically successful home gaming consoles. The platform provider market is highly competitive with high barriers of entry. Big players in this market require an immense amount of capital for research and development, manufacturing, and marketing expenses. For example, when Microsoft launched the Xbox home console in late 2001, it promised a \$500 million budget

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<sup>a</sup> These terms will be used interchangeably.

for advertising and marketing expenses alone. The ultimate goal of a platform provider is to deeply penetrate the market while maintaining low manufacturing costs.

The hardware manufacturers traditionally follow a “razors and blades” revenue model in which the hardware consoles (the razors) are sold at a discount in order to promote the sales of the console’s accompanying software (the blades).<sup>b</sup> The consoles are sold as loss leaders while the hardware manufacturers recoup their costs through royalty revenues attained via software sales. (Hardware manufacturers typically receive royalty payments of approximately 15%-25% of a game’s retail price on a per unit basis.)

Additionally, platform providers develop, publish, and distribute their own video game software exclusively for their console systems. Today, gaming software that is produced in-house and marketed to the public by the console manufacturer itself accounts for nearly 20% of the overall software revenues in the home video game software market in the U.S.<sup>5</sup> Exclusive console game titles are of exceptional importance in the video game industry as they drive the adoption of a particular console system and assist in maintaining a loyal consumer base.

Finally, hardware manufacturers maintain and coordinate relationships with independent software publishers in order to build a solid gaming library for their respective console systems.

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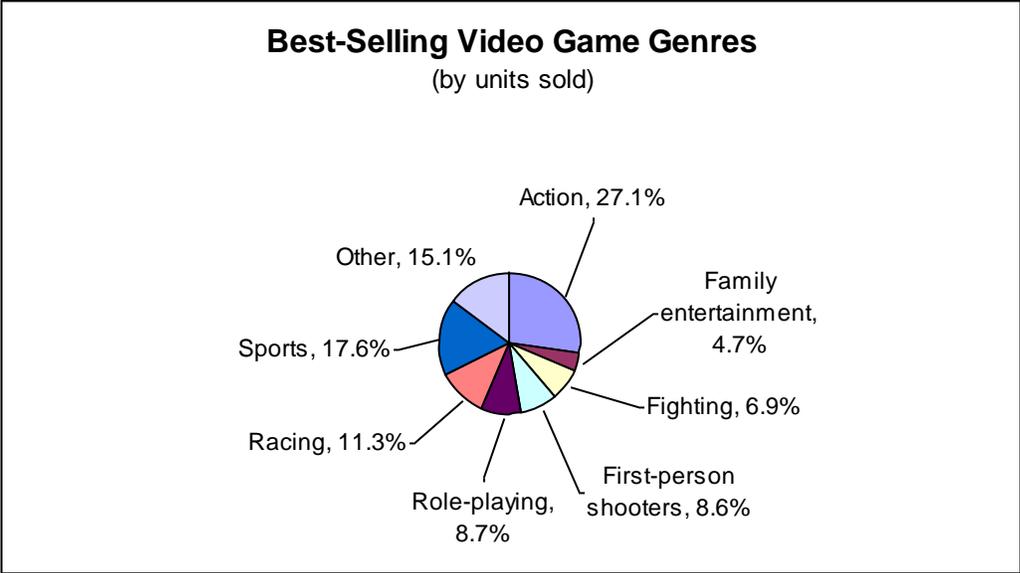
<sup>b</sup> The “razors and blades” revenue model of the video game industry differs slightly from the traditional razors and blades revenue model used by firms such as Gillette. This is due to the fact that while actual razor manufacturers generally recoup their costs via revenues attained from blades that are produced and sold in-house, video game hardware manufacturers generally recoup their costs through royalty payments on games developed, marketed, and sold by third-party software publishers. The video game industry’s model is therefore a loose interpretation of the traditional “razors and blades” model. Yet for all intensive purposes, it serves to prove the same point; namely that hardware costs are recouped via software sales. (Additionally, this revenue model *is* in fact in sync with the video game industry in terms of video game software that is developed and sold in-house by hardware manufacturers.)

### 3.2 Software Developers/Publishers

“Content is king” is the general rule of thumb in the video game industry. Approximately two thirds of the \$10 billion domestic interactive entertainment sales are derived from software sales, while the other third are attributed to hardware sales. Software publishers work in conjunction with software developers (either in-house or outsourced independent developers) to develop, market, and distribute gaming titles.

Gaming software can be subdivided into several categorical genres such as action, family entertainment, fighting, first-person shooter, role-playing, racing, and sports. As *Figure 1* illustrates, action and sports games captured the most consumer attention in 2003 with 27.1% and 17.6% market share, respectively.

**Figure 1: Video Game Genres** <sup>6</sup>



While some video game software is developed from original concepts, many games use the characters, storyline, or likeness of existing entertainment content. Video game publishers<sup>c</sup> heavily compete for the rights to licensing agreements with sports franchises/athletes, cartoons, TV characters, films, and other protected intellectual property. Exclusive licensing rights give software publishers an opportunity to differentiate their games in a crowded marketplace and to essentially monopolize a narrowly targeted niche within the software industry.

Similar to the film and music industries, the video game industry is a hit-driven business. Video game publishers rely on blockbuster hits to compensate for video games in their portfolio that flop in the marketplace. Software publishers also heavily rely on game franchises and sequels to perpetuate sales of their software. Due to fleeting consumer attention and limited shelf space in retail stores,<sup>d</sup> video game publishers depend upon successful sequels in order to extend the overall shelf-life of the franchise, rather than the title itself.<sup>7</sup>

Software publishers must constantly make strategic decisions concerning the quality, timeliness, and pricing of their gaming software. In addition, publishers continuously conduct market research in order to monitor consumer demand and changing tastes. Overall, a publisher must rely on dominant game franchises, strategic competitive positioning, and strong financial backing in order to emerge successfully (and profitably) in the video game industry.

### **3.3 Retailers**

Video games reach the ultimate consumer through a variety of different channels. Video game hardware and software are distributed through specialty electronics stores, toy stores, mass

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<sup>c</sup> We will use the term “publishers” as an umbrella term for both video game developers as well as video game publishers (unless otherwise noted).

<sup>d</sup> The overwhelming competition for shelf-space is evidenced by the fact that over 850 new consoles games were introduced to the consumer market in 2004, while it was estimated that retailers such as Wal\*Mart, Target, and Toys ‘R’ Us limited their shelf space to only about 200 of the best selling video games titles.

merchants, and even mail-order catalogs and the internet. As *Table 1* illustrates, mass merchants such as Wal\*Mart and Best Buy have emerged as the dominant retail outlets in the video games industry, with a combined market share exceeding 30%.<sup>8</sup> Specialty shops such as GameStop and Electronics Boutique continue to attract the hard-core gamer, while traditional toy stores such as Toys ‘R’ Us have taken a hit due to the fact that the average age of gamers has increased and games are seen less as “toys” for children. (Gamers’ demographics will be discussed in the following section.) Retail gross margins typically range from as low as 20% to as high as 30%.<sup>9</sup> However, with the recent concentration of retail sales among only a few dominant players, retailers are gaining more and more leverage in the video game value chain (as publishers compete for valuable shelf space and consumer attention).

**Table 1—U.S. Retailer Market Share (2003)** <sup>10</sup>

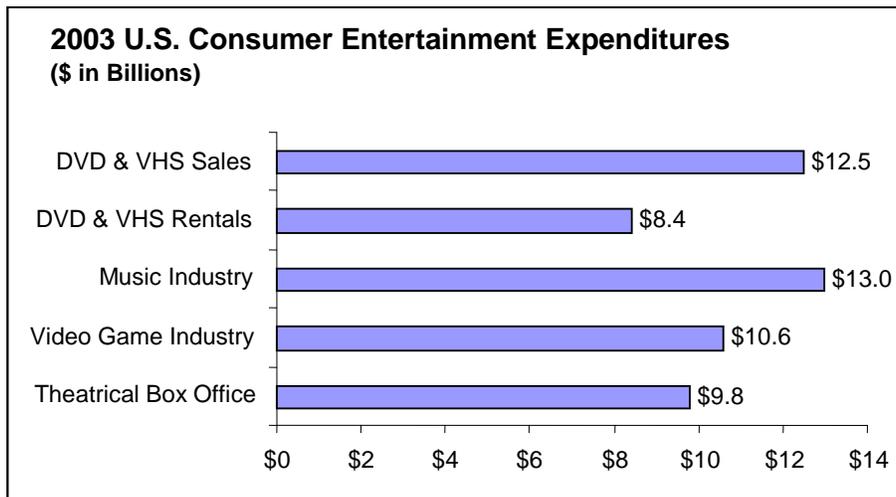
<u>Rank</u>	<u>Video Game Retailer</u>	<u>Share</u>
1	Wal*Mart	21%
2	Best Buy	13%
3	GameStop	12%
4	Target	10%
5	Toys ‘R’ Us	9%
6	Electronics Boutique	9%
7	Circuit City	4%
8	KB Toys	3%
9	Kmart	2%
10	Costco	1%
	Others	16%
	Total	100%

### **3.4 End-Consumers**

Video games have traditionally been stigmatized as an escape from reality for socially inept adolescent boys and a favorite pastime for hard-core techies. However, over the past two decades video games have transformed the landscape of interactive entertainment and have become a fully-embraced and legitimized household activity.

Wedbush Morgan Securities estimates that the global sales of the interactive game sector totaled approximately \$25.5 billion in 2003 alone.<sup>e</sup> As *Figure 2* illustrates, U.S. consumer expenditures in the video game industry exceeded \$10 billion—surpassing consumer expenditures in theatrical box office receipts and other competing forms of traditional entertainment media.

**Figure 2:**<sup>11</sup>



The traditional video game market is comprised of the young male demographic audience of 8 to 16 year olds. Today, over 90% of children ages two to seventeen have regular access to video and computer games.<sup>12</sup> In fact, television network executives have begun to point fingers at the video game industry in response to a sharp decline in television viewership among the valuable young-male demographic segment.<sup>13</sup>

However, video games are not just for a niche audience anymore. According to the Entertainment Software Association (ESA), five out of ten Americans play video games in one

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<sup>e</sup> This figure includes: video game hardware—including both home consoles and handheld devices, although excluding PC hardware; video game accessories (memory cards, controllers, etc); and video game software for video game hardware (as defined above) and personal computers.

form or another. Piper Jaffray estimates that there are approximately 51.8 million gamers in the United States—70% of those representing mass-market/occasional gamers, and the remaining 30% being equally split between avid gamers and casual/non-gamers.

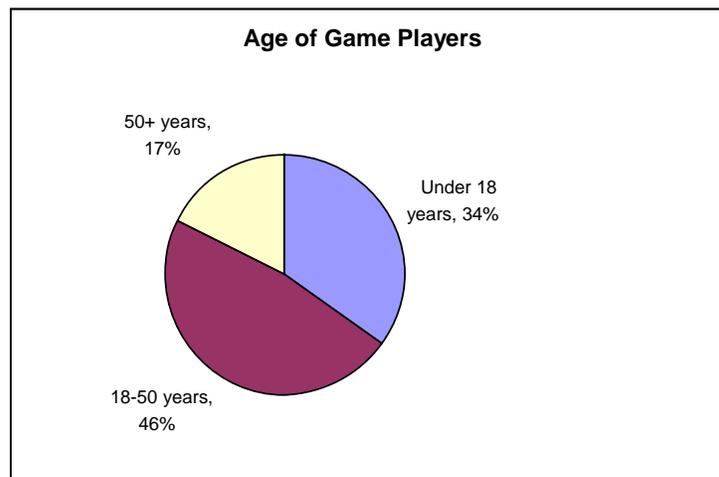
Video games are no longer regarded as “child’s play” or devices used in order to keep children occupied and content. A recent trend in the video game industry is a widening age demographic of the interactive game consumer. The average game player’s age in 2004 was twenty-nine. In contrast to traditional toy manufacturers, the video game industry has been able to immensely benefit from the aging of its playing population. As the video game consumer transitions into adulthood, video game manufacturers are able to retain the gamer by providing the gamer with new, exciting, and more mature software content. All the while, video game manufacturers begin to target the new generation of young consumers that enter the market. *Figure 3* illustrates the closing of this age gap with 34% of U.S. gamers younger than 18 years of age and 17% of gamers exceeding the age of 50. According to the ESA, more than half of game players expect to be playing as much or more video and computer games ten years from now as they are today. Moreover, 39% of all game players are female.<sup>f</sup> These trends have led to a significant increase in the number of gamers in the United States.

Overall the video game industry has exploded into a social and cultural phenomenon. Last year Americans spent more hours playing video games than watching rented movies.<sup>14</sup> Video games possess mass market appeal, and video game manufacturers continually attempt to exploit the video game industry’s ever-increasing popularity.

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<sup>f</sup> However, this ESA figure refers to both video game and PC software. Piper Jaffray estimates that the female penetration rate drops considerably to approximately 7% when referring to video game software in isolation (*i.e.*: console and handheld).

**Figure 3: Age of Video Game Players** <sup>15</sup>

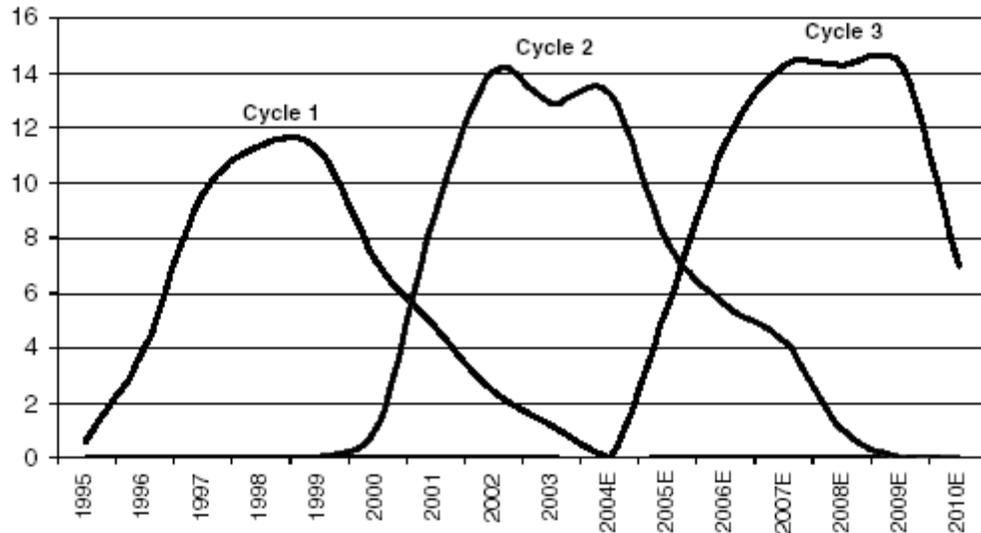


#### **4. How the game continuously changes**

The video game industry can be characterized by its relatively dynamic and evolutionary-driven nature, constantly propelled by technological advances. Hardware manufacturers typically launch a new generation of home consoles every four to six years (oftentimes referred to as a hardware “cycle”). The beginning of each generation is usually marked by a sharp increase in sales with the introduction and adoption of the new generation of consoles and their accompanying software. Sales tend to peak and plateau towards the third year of the cycle as penetration rates near market saturation. Sales then tend to slump as consumers anticipate the emergence of the next generation of consoles. *Figure 4* illustrates the generational nature of video game consoles, as it documents the millions of hardware units sold in North America for the current and recently-past console generations, and forecasts the inverted U-shaped sales pattern of the upcoming launch of new hardware.

**Figure 4: Video Game Hardware Cycle**<sup>16</sup>

Estimated Millions of Units—North America (Data current up to 2003)



Cycle 1: PS One, N64, Dreamcast  
Cycle 2: PS2, GameCube, Xbox  
Cycle 3: PS3, GameCube 2, Xbox  
Source: NPD Funworld and Piper Jaffray Estimates

In the video game industry, each new hardware generation is referenced by the prevailing central processing unit (CPU) technology of that era (*i.e.*, 8-Bit, 16-Bit, 32/64-Bit, 128-Bit, etc.).<sup>17</sup> (See *Exhibit 2* in **Appendix A** for an illustration of U.S. video game hardware sales according to “bit” generation.) During the typical five year intervals between platform generations, hardware manufacturers strive to develop their newest console systems (historically the manufacturer waits for the commoditization of the console’s technological components in an effort to reduce production costs) and attempt to recoup development costs through sales of current generation software. Console manufacturers and software publishers are constantly pressured (predominantly by competitor rivalry and consumer demand) to keep up with technological advancements. While console manufacturers used to be content with building their hardware using mainstream technologies that were proven, familiar, and affordable, competitive

pressures have ensured that today's consoles are at the forefront of integrated circuit development. For instance, Sony's next generation console, the PlayStation 3 (slated with a late 2006 launch date), is expected to be nearly 1,000 percent more powerful than its current PlayStation 2 console, and will possess a processor that is capable of one-trillion calculations per second.<sup>18</sup>

Software sales typically follow a similar generational pattern in accordance with hardware sales (though software cycles generally tend to lag a year behind hardware cycles and have a longer lifespan of seven to ten years<sup>g</sup>). Transitions to new hardware generations and technology create a landscape of uncertainty for the developers, publishers, and retailers. Developers and publishers must decide how to allocate their time and monetary resources between creating gaming software for the current and next-generation of hardware consoles. Publishers are often times hesitant to devote a significant amount of resources towards the new console systems unless they are confident that the next-generation console will be a dominant player in the marketplace. However, as *Figure 5* illustrates, successive console cycles tend to result in increased sales of video game software.<sup>h</sup> Therefore it would not be unreasonable for publishers to take an optimistic stance regarding the sales of their future generations of software. Additionally, retailers have to decide how to apportion premium shelf-space among the multiple generations of hardware and software. These factors add to the variability and unpredictability of a video game console's success in the marketplace. Nevertheless, as *Table 2* illustrates, each successive console cycle has resulted in increased sales and a larger installed base of hardware owners. (See *Exhibit 4* in **Appendix A** for a timeline account of several of the leading hardware consoles released since the inception of the home video game market.)

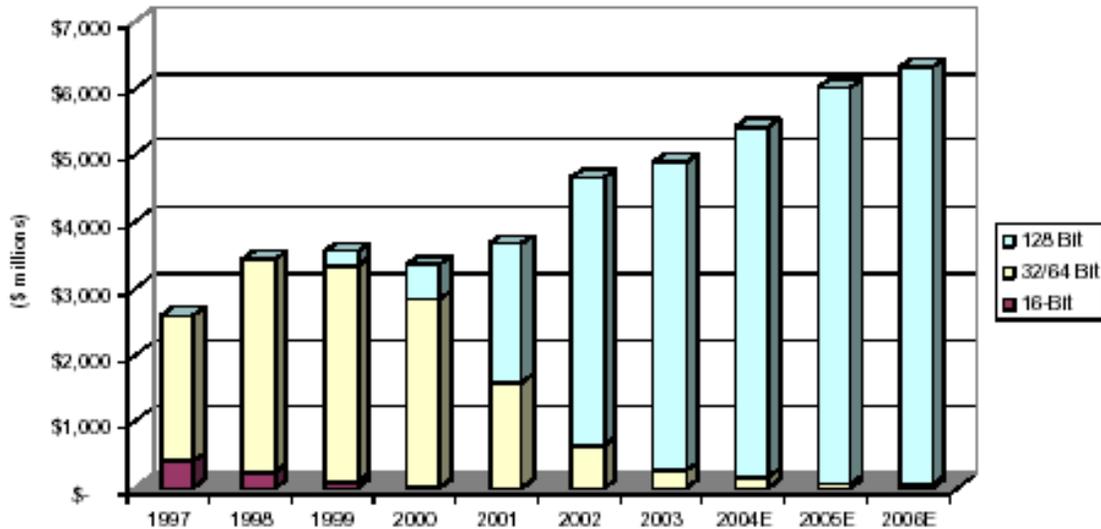
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<sup>g</sup> We are referencing the product life cycle of *generational software* as opposed to a particular gaming title.

<sup>h</sup> See *Exhibit 3* in **Appendix A** for additional information on U.S. video game product sales.

**Figure 5: U.S. Software Sales by Platform** <sup>19</sup>

(\$ in billions)



**Table 2: U.S. Console Cycles and Hardware Launches** <sup>20</sup> (Data current up to 2003)

US Launch Date	CPU	Manufacturer	Console	Life Cycle Units Sold (Mil)
1985	8-bit	Nintendo	NES	36.3
			<i>Total</i>	<i>36.3</i>
1989	16-bit	Sega	Genesis	18.5
1991	16-bit	Nintendo	SNES	20.0
			<i>Total</i>	<i>38.5</i>
1995	32-bit	Sega	Saturn	1.4
1995	32-bit	Sony	PlayStation	30.4
1996	64-bit	Nintendo	N64	18.0
			<i>Total</i>	<i>49.8</i>
1999	128-bit	Sega	Dreamcast	4.1
2000	128-bit	Sony	PS2	44.2
2001	128-bit	Microsoft	Xbox	18.4
2001	128-bit	Nintendo	GameCube	16.4
			<i>Total</i>	<i>83.1</i>

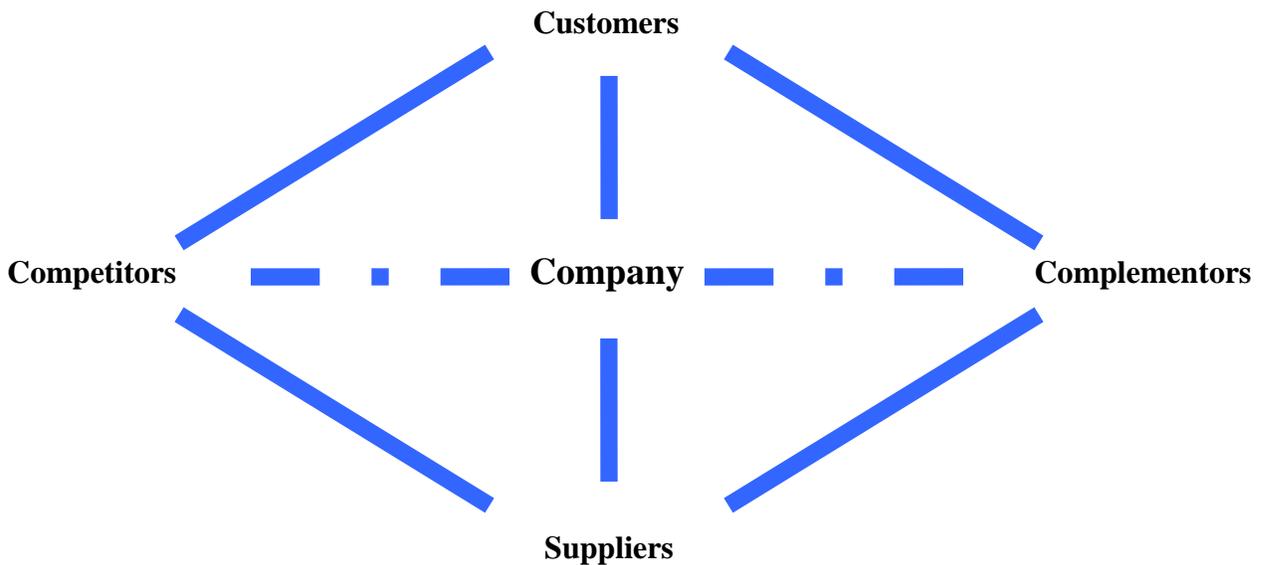
## 4.1 Game Theory's Analytical Tools

The game of business revolves around the notion of *value*—how it is created, and in turn, how it is divided in the marketplace. Two key analytical tools, ‘Value Nets’ and ‘Added Value,’ will allow us to examine how ‘players’ in the ‘game’ of business cooperate in order to create value, and how they compete in order to divide that same value.

A Value Net is a schematic map of the interactions and interdependencies among all the players in the game. The players in the game include all entities with which a firm might interact while creating and dividing value within the marketplace—namely, suppliers, customers, competitors and complementors. As one can see from *Figure 6*, customers and suppliers interact on the vertical dimension, while competitors and complementors interact on the horizontal dimension. Along the vertical dimension, resources and products/services flow from the suppliers to the firm and from the firm to the customers. Simultaneously, money flows from the customers to the firm and from the firm to its suppliers.

Along the horizontal dimension, competitors can be defined as any alternative players whose presence causes customers to value your product or service *less* than they would if your competitor was not in the market. On the other side of the horizontal dimension are a firm’s complementors. A player is your complementor if customers value your product *more* when they have the other player’s product than when they have your product alone.<sup>21</sup> In other words, complementors are players who create complements for the firm’s goods or services, which in turn make the firm’s original product/service more attractive to possess.

**Figure 6: The Value Net**



The Value Net represents the symmetries between the players in each of the two dimensions. The firm must come together with customers and suppliers in the overall production and distribution process in order to create value in the marketplace. Additionally, along the horizontal dimension, the firm must carefully monitor its competitors and be sure not to overlook the importance of its complementors in order to take away a maximum amount of value from the game. One must also recognize that competitors are not always necessarily a firm's enemies, just as complementors are not always necessarily a firm's friend.

Overall, once a firm's Value Net maps out the interdependencies among the players of the game, it can then examine how value is created—and more importantly—how value is divided among its members. The firm can then more easily determine whether it is exploiting all its potential value-creating transactions through its interactions and relationships with the other players in the game. Ascertaining a player's added value—that is, a player's marginal contribution to the game—will help in such an analysis.

Although Value Nets and added value are not necessarily quantifiable analytical tools, as we will explore in *Section 5*, they will enable the firm to develop richer and more dependable strategies in order to capture a larger piece of the value pie, as interdependencies and relationships among players are constantly shifting as the game progresses. (Refer to **Appendix B** for a more thorough review and discussion of the theoretical aspects and implications of Value Nets and added value.)

## ***4.2 Applying Game Theory's Tools to the Video Game Industry***

Each Value Net will be constructed from the perspective of the dominant console player in each of the “bit-era” console generations. (See *Sections 4.4-4.7* for each generation’s Value Net.) The players that each of the prevailing console manufacturer interacts with will include:<sup>i</sup>

- **Customers:** This set of players includes retailers through which video game hardware and software are sold, end-consumers (we will highlight the target demographic segment), and licensees of first-party game content [*i.e.*, the hardware manufacturer (first-party publisher) licenses out the likeness of its video game characters/themes for movies, TV shows, toys, clothing, mugs, etc. Therefore, by acting as content providers, the platform provider receives payments/royalty fees based upon these licensing agreements].
- **Suppliers:** This set of players includes microchip providers (as well as other physical components, raw materials, and labor used in the manufacturing processes), content-providers, and game developers.
- **Competitors:** This set of players includes traditional toys and electronic devices such as TVs, PCs, handheld consoles, mobile phones, the internet, etc. Competing home video game consoles—current, past, and expected future generation systems—of course fit into this category as well.

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<sup>i</sup> Due to the sheer immensity of the video game industry, we will only be highlighting certain key interrelationships within the industry.

- **Complementors:** This set of players includes software publishers, internet providers (through which online gaming can be played), and video game publications, trade magazines, fan clubs, websites, etc.

Our added value analysis will look exclusively at the relationships and interdependencies between *hardware manufacturers* and *software publishers* within the video game industry.<sup>j</sup> The goal of our analysis is to map out the interrelationships between the platform providers and software publishers, and to qualitatively determine how the overall value of the industry was created, and subsequently divided, over the successive console generations. We aim to show that while in technical and definitive terms software publishers serve as complementors to hardware manufacturers, the software publishers are imbedded in a deep competitive rivalry with the hardware manufacturers to capture value in the marketplace. In other words, though these two players thrive off of each other, they are not necessarily at peace with each other.

The broader contextual analysis brought forth through Value Nets and added value will allow us to evaluate the strength of the platform providers' (and/or software manufacturers') positions in the video game market and will aid in monitoring and understanding their respective strategic moves within the marketplace. Overall, it will allow us to create a framework in which we can examine the past and current interactions between these two players, evaluate their interests and added values, and formulate projections for the future trends and interdependencies between the hardware manufacturers and software publishers within the video game industry.

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<sup>j</sup> For the most part, we will be excluding all other complementors, competitors, customers, and suppliers. We will be focusing *solely* on the relationships between console manufacturers and software publishers.

### **4.3 Hardware and Software—Perfect Complements, Perfect Foes**

Video game hardware and software go hand-in-hand. Without an expansive library of exceptional video game titles, consumers would have virtually no impetus to purchase a gaming console. Similarly, without a well-manufactured and technologically capable console, software publishers would not want to expend resources to develop and produce gaming software for a particular system.

Most software publishers develop video games for each of the dominant console manufacturers. Publishers typically pay a licensing royalty fee of 15%-25% to hardware manufacturers for each copy of the gaming title sold. Multiple console platforms provide increased channels of revenue through the sales of the same game title for different systems. These different systems enable software publishers to reach a broader consumer base and to leverage their R&D and marketing costs.<sup>k</sup> However, although the video game will possess the same theme and characters on the different platforms, each version will differ slightly depending on the gaming hardware. The game publisher therefore must make a heavy investment in becoming proficient in each of the console's respective technologies and functionalities. (As a practical example, let's say that a publisher were to create and develop a game for a particular 128-bit gaming console for approximately \$6 million. It would then cost an additional \$1-\$2 million to port that game to each of other gaming consoles. See **Appendix C, Exhibit 1**, for a breakdown of the generic development cost-economics of a gaming title in the 128-bit era.) Additionally, video game publishers are hesitant to create versions of their games for a given console unless the platform already has a wide installed base of players. However, this poses a

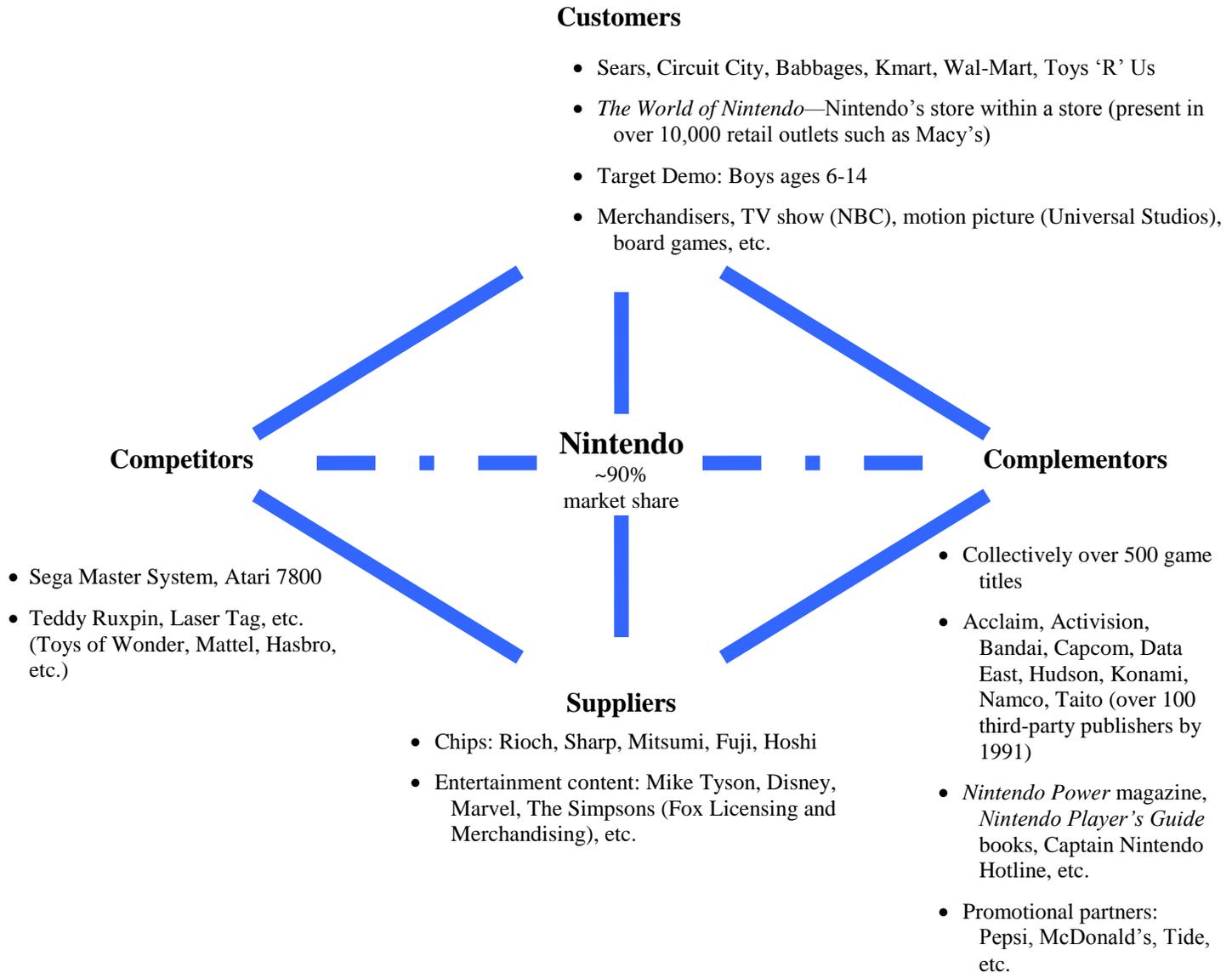
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<sup>k</sup> Marketing and R&D expenses can eat up anywhere from 15% to over 90% of the gaming title's sales revenues—depending on its sales performance in the marketplace.

“chicken and egg” dilemma because it is difficult for consoles to build a strong installed base without an adequate library of games.

The following subsections will trace the relationships between hardware manufacturers and software publishers through the successive generations of video game consoles. As will be illustrated, there exists both a complementary as well as a heavily competitive aspect to the nature of the relationship between video game hardware manufacturers and third-party software publishers. Each works together in order to create value in the marketplace. However, there is an ongoing battle for how that value is divided amongst them. We will also cite an equalization of bargaining power and added value that has begun to emerge between the hardware manufacturers and software publishers within the video game industry. These shifts of power stem from factors such as intensified competition among the rival console manufacturers, tremendous technological advances in hardware and software development, and the reliance on big-hit gaming titles in the video game consumer market.

## 4.4 8-Bits: (1985-1990)



The Nintendo Entertainment System (NES) was introduced in the United States in 1985 and to this day is credited with reinvigorating the video game industry from its post-Atari crash of 1983. “Nintendomania” swept across the nation and by 1990 nearly 30 million NES console units had been sold.

Nintendo had ample experience in the video arcade industry before it transitioned into home video game consoles. Therefore, Nintendo had the know-how and capabilities to develop hit-games and to attract consumer attention. However, one of the major contributory factors to Nintendo's success revolved around its relationships with its third-party software publishers. Nintendo recognized the crucial sales-driving nature of video game software and therefore made key strategic decisions in order to position itself advantageously and profitably in the marketplace.

Nintendo actively courted the involvement of third-party publishers. However, Nintendo executives were determined not to let the market become saturated with mediocre gaming titles. (This occurrence was believed to have triggered the ultimate demise of Atari, Nintendo's predecessor.) In order to ward off fraudulent games that were not sanctioned by Nintendo, the NES was protected by a security chip (known as the 10NES) installed in each console and Nintendo-approved game, which locked out unauthorized cartridges. This security system allowed Nintendo to retain control over the manufacturing of its games and the amount of inventory that entered the marketplace. Additionally, Nintendo marketed its Nintendo Seal of Quality, which informed game buyers that the software title was approved by Nintendo. These restrictive practices enabled Nintendo to make its third-party publisher licensing agreements a somewhat rare and well sought after commodity. The overall high demand to become a Nintendo third-party publisher actually lowered the added values of the publishers who *were* granted licensing rights. This is due to the fact that the licensing rights were so highly coveted (and generally profitable) that Nintendo was able to handpick which publishers were permitted to develop NES games. In other words, if any one of the third-party publishers was removed from

the game, the overall resulting impact would be inconsequential because that company could be easily replaced by a slew of prospective substitute publishing firms in the marketplace.

Nintendo implemented stringent licensing agreements with its third-party publishers. The publishing firms were forced to pay a licensing fee to Nintendo for every game sold, buy development kits directly from Nintendo, and utilize Nintendo as the manufacturer for all cartridges and packaging. It typically took a publisher nine months to develop the product, one month to test it, and an additional month to pass through Nintendo's quality assurance process. Publishers then had to place an order for at least 10,000 cartridges, which in turn Nintendo would sell back to the publisher for a cost of \$9-\$14 per piece. Licensees were therefore responsible for all inventory, distribution, and sales expenses, as well as risks. Additionally, Nintendo reserved the right to dictate pricing, censor explicitly sexual or violent material in its games, decide on the quantity of cartridges produced for each game it would manufacture, and enforce a five-title limit on the number of games publishers were permitted to produce over a given year.

Furthermore, Nintendo insisted on exclusive partnership agreements with publishers (*i.e.*, the video games published had to be exclusive to the NES for a period of two years). By forcing publishers to sign exclusivity agreements, Nintendo was able to ensure that its competitors would not be able to replicate its successful library of games. This tactic raised the barriers of entry into the hardware market and enabled Nintendo to retain its monopolistic status, and in turn increase its added value. Overall, Nintendo was able to implement a strict quality control policy and maintain final authority over the specific titles being produced and quantity of games being manufactured.

Nintendo's virtual monopoly power allowed it to secure one-sided alignments with its third-party publishers and to essentially manipulate the rules of the game in order to maximize its

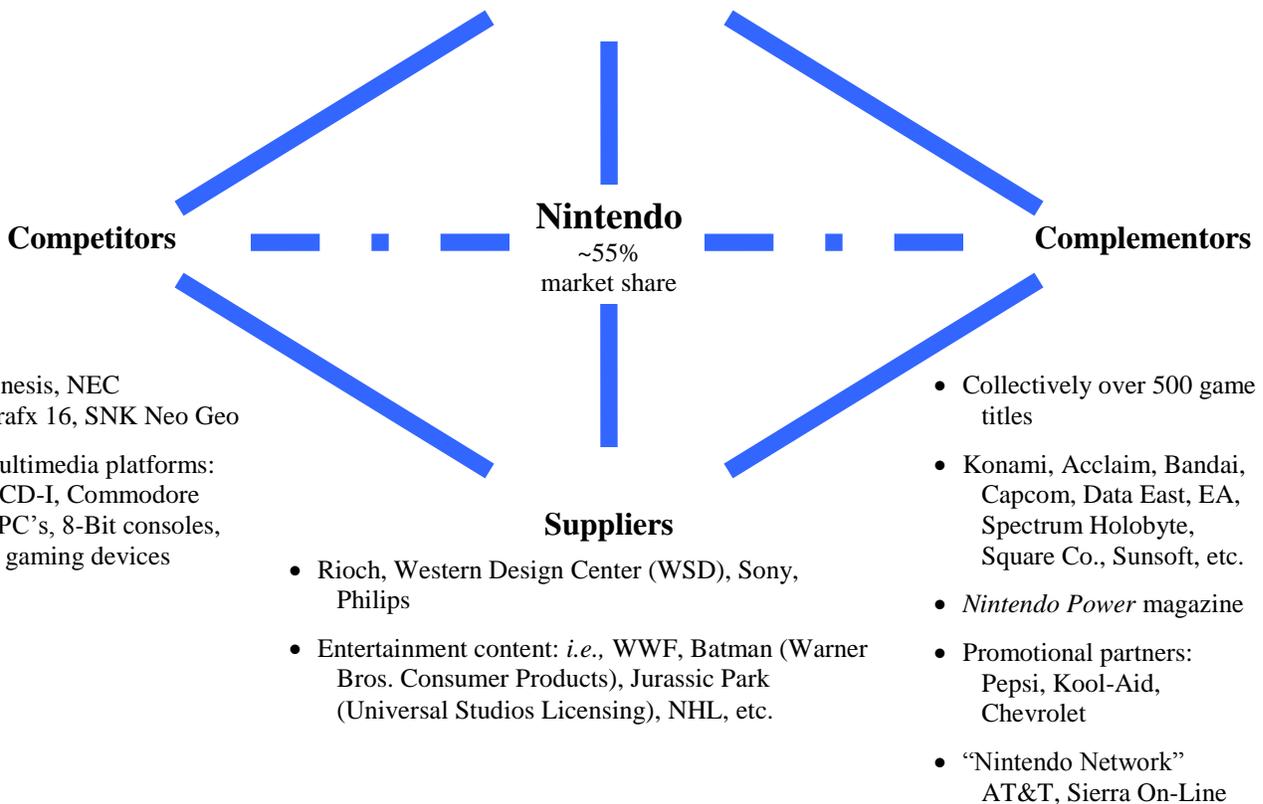
added value. In addition, with Nintendo developing its own in-house software, it was able to create its own hit games without the aid of third-party publishers acting as catalysts to drive sales. The success of Nintendo's in-house software decreased the added value of the publishers, since Nintendo was not forced to exclusively rely on their software in order to sell consoles and cartridges.

Nintendo in and of itself held the majority of the industry's value—if Nintendo were to leave the game, the value pie would dramatically decrease in size. Conversely, if any of Nintendo's licensees were to leave the game, the value pie would not be exceptionally impacted. Overall, the 8-Bit era (better termed the Nintendo-era) culminated with complete Nintendo dominance. Third-party publishers had nearly no bargaining power and were forced to abide by the standards and rules set forth by Nintendo. This era established a benchmark for how the game could be played within the video game industry, and revealed the keys to dominance and ultimate success for future console generations.

## 4.5 16-Bits: (1990-1995)

### Customers

- Toys 'R' Us, Wal-Mart, Kmart, Sears, Babbages, Blockbuster Entertainment (SNES available in over 16,000 retail outlets in its first 4-months out)
- Target Demo: Boys ages 6-14; Secondary: Girls 6-14
- Merchandisers, TV shows, motion picture (Buena Vista 1993), etc



The 16-bit era brought a renewed sense of competition to the video game industry. The Sega Genesis was launched in the United States in 1989 and successfully competed with the technologically inferior 8-bit NES. Sega touted the slogan, "Genesis does what Nintendon't." Though Nintendo claimed a stronghold over 90% of the U.S. video game market, Sega Genesis'

release marked the end of the NES's dominance and the emergence of an actual *competitive* landscape within the video game industry.

Nintendo released its 16-bit console, the Super Nintendo Entertainment System, to directly rival the Sega Genesis in 1991. Sega wisely utilized its two year lead by actively developing games that took advantage of its console's more powerful technology and capabilities. As Sega's popularity increased, it was able to recruit an abundance of third-party publishing firms and even lure many publishers to break their exclusivity agreements with Nintendo. One reason Sega successfully penetrated the video game market in the early 1990's was that third-party software publisher Electronic Arts provided a robust library of games that were higher in performance and lower in cost than existing 8-bit Nintendo games.<sup>1</sup> Sega battled Nintendo head-on and proved to be a worthy competitor. According to the market research firm NPD, by the end of 1991 Sega claimed a 55% market share, edging out Nintendo's 45% share. (However, by the end of the 16-bit era Nintendo just barely edged out Sega as market share leader.)

The video game industry's transition into a hardware duopoly altered the way in which the game was played and how the players interacted. Nintendo's added value decreased as it was no longer the only major player in the game and was not able to call all the shots. In contrast to the 8-bit era, if Nintendo were to now leave the game, the value pie would still retain substantial residual value without its presence.

Coupled with a decrease in Nintendo's added value came an increase in third-party publishers' added value. Nintendo put an end to its exclusivity clauses and publishers were able to offer their titles to both console platforms. In the most primitive of senses, an equalization of

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<sup>1</sup> EA was allowed to make as many titles as they wanted and could approve their own games for the Sega Genesis. The royalty fees were also much more palatable than in Nintendo's licensing agreements. These special rights were only granted to EA—not Sega's other third-party publishers.

power between the hardware manufacturers and the software publishers began to emerge. Competition for a solid supply of games translated into the console providers *needing* the software publishers. If a publisher's video game was successful on one platform then there was an automatic pressure for the other hardware platform to manufacture that same title for its consumer base. Video game publishers were no longer viewed as a dime a dozen, and began to feel a sense of independence.

However, despite the end of Nintendo's reign as virtual monopolist over video game hardware, many of the stringent licensing provisions remained in place by both Nintendo *and* Sega. Both firms regulated pricing and charged a licensing fee on a per cartridge basis.<sup>m</sup> (Sega charged developers approximately \$16 per cartridge vs. Nintendo's \$18 per cartridge.<sup>n</sup>) Both platform providers regulated supply by granting licensing rights and restricting the number of titles a developer could have on the market. Additionally, both Sega and Nintendo had game-screening processes in which they "edited out" a game's undesirable segments before a licensed developer was granted the rights to manufacture and sell that title.<sup>22</sup> During this console generation the software publishers were very fragmented and still did not possess a great degree of bargaining power.

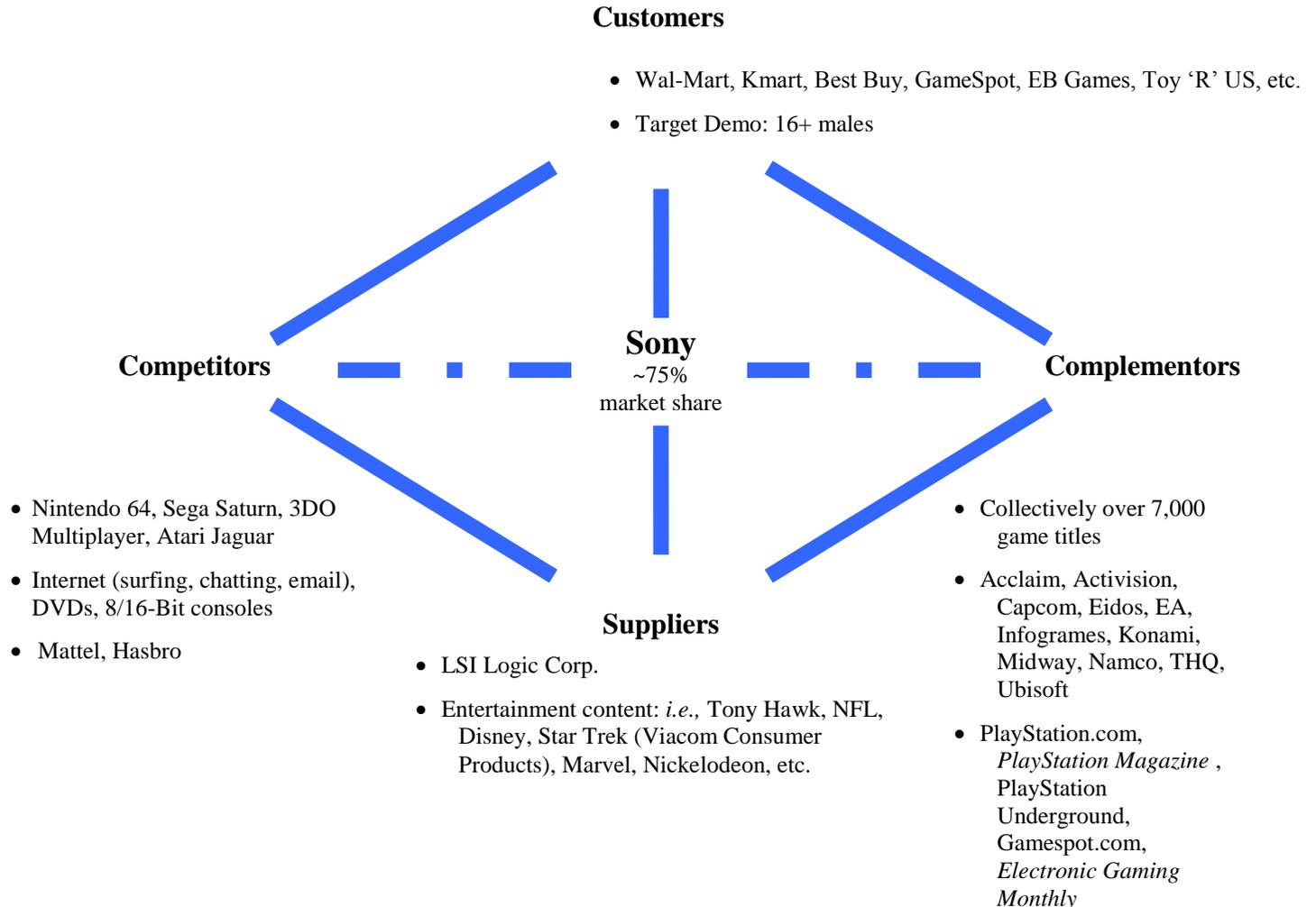
However, regardless of the console manufacturers' stipulations, the 16-bit era represented an emerging shift of power and leverage from hardware manufacturers to software publishers within the video game industry.

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<sup>m</sup> However, Nintendo now permitted publishers to manufacture their own software. Nintendo charged a 20% royalty fee based on wholesale price and charged \$1 per required Nintendo security chip.

<sup>n</sup> The \$18 per cartridge Nintendo fee represents the before-volume discount of \$4 on units of 400,000 or more.

## 4.6 32/64-Bits (1995-2000)



The 32/64-bit era marked a transitional period from cartridge-based software to the CD-ROM-based format of delivering gaming content. Additionally, this hardware generation brought forth an oligopolistic competitive landscape on the hardware side with the launch of three new hardware consoles by Sony, Nintendo, and Sega. The landscape of the industry continued to evolve, and in order to capture substantial value there was pressure to adapt to the shifting dynamics of the game and the way it was played.

Sony, a long-established giant in the consumer electronics industry, decided to test the waters of the home video game industry in 1995 with the release of its 32-bit PlayStation console. Although Sony had lackluster in-house software design teams, Sony made key acquisitions in software development companies and recruited top-notch industry-seasoned executives to lead it into the next generations of gaming consoles. Additionally (and quite critically), by the time Sony launched the PlayStation in the U.S. nearly 100 publishing companies had signed licensing agreements, and more than 300 individual game projects were planned or under development. PlayStation's easy programmability, along with Sony's liberal licensing fees (\$10 per game) and aggressive marketing campaign made the PlayStation very appealing to game developers. On the other hand, the 32-bit Sega Saturn (released that same year) possessed internal hardware architecture that proved to be less than user friendly according to many game developers. Consequently, fewer third-party publishers released titles for the Saturn, as was reflected in its disappointing sales. Nintendo 64 (N64), Nintendo's 64-bit console system released in 1996, shared a similar fate (though it fared significantly better in the market than Sega's Saturn). N64 did not possess a sufficient breadth of games in its library relative to Sony's accumulated collection (and the games that the N64 did have were typically both expensive and limited in scope). Therefore, for the first time since Nintendo entered the home video game market in 1985, it had to relinquish its title of "King of the Consoles."

The heated competition stemming from the three dominant platforms resulted in an overall decrease in the added value of the hardware manufacturers. In fact, Sega actually ceased Saturn production and was edged out of the 32/64-bit console market altogether due to dismal sales, intense competition, and lack of third-party support.<sup>o</sup> Software publishers no longer

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<sup>o</sup> Sega discontinued the system in 1998 after selling only 2 million Saturn consoles in the U.S. compared to PlayStation's 10.75 million units sold. Sega had to absorb a \$450 million loss that year.

needed to tie themselves down to one particular console platform as they did in prior generations. Instead of the publishers yielding to the whims of the platform providers. Software publishers continued to gain clout (and added value) in the marketplace due to their differentiating content and the fact that software sales were the driving force behind hardware purchases.

Another trend of the 32/64-bit era was the transition from cartridges to CD-ROMs as a means of delivering gaming content. Both Sony and Sega utilized a CD-based format, while Nintendo chose to remain with the traditional cartridge format.<sup>P</sup> This utilization of new technology brought advantageous results to the players involved. While it cost \$12-\$20 to manufacture a gaming cartridge, it only cost \$1-\$2 to produce a CD. Additionally, since CD-ROMs could store up to 100-times more data than cartridges, software developers could include heightened graphics, audio and video clips, and more complex gameplay to CD-based games. This dramatic decrease in manufacturing costs meant that publishers could more easily (and cheaply) develop smaller run game-releases for niche target audiences. Publishers could be more creative and, more importantly, develop games that encompassed a wider consumer base. In fact, during this era Namco and Square Soft (publishing houses) switched their allegiances from Nintendo and agreed to make console games exclusively for Sony PlayStation because they claimed that their developers had more leeway for artistic creativity while designing games for Sony's CD-ROM format—a sentiment that seemed to be shared by several other publishing firms across the board. Additionally, the lower cost of this delivery format allowed third-party publishers to receive a greater portion of revenues for the 32-bit CD titles (42%) compared to the traditional cartridge-based games (22.5%).<sup>23</sup>

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<sup>P</sup> Nintendo reasoned that CD-ROMs took longer to load than cartridges and therefore diminished the gaming experience. (However, while some speculated that Nintendo opted for cartridges to avoid piracy; others claimed that Nintendo wanted to retain authority over third-party game production.)

Software publishers increased their added value by continuing to develop hit-game titles and franchises that exploited the newly available software memory capacity. For instance, Activision—a development, publishing, and distribution software firm—established key strategic relationships with content providers such as Disney, Lucasfilms (Star Wars), and Marvel. With these strong brand names and the newfound ability to more easily diversify its product and audience mix, Activision’s revenues soared from \$41 million in 1995 to \$584 million in the year 2000.

However, the 32/64-bit era also initiated the trend of consolidation among the software publishers. Big name titles from well-established capital-backed firms dominated over smaller publishing houses. This in turn increased the added value of the leading software publishers such as Electronic Arts, Infogrames, Activision, THQ, and Havas who had the capital and human resources to produce hit games and to secure value within the booming video game industry. (Each of these firms had revenues surpassing the \$200 million mark in the fiscal year 2000.<sup>9</sup>)

Each platform provider wanted to ensure that its library of games would include all of the hottest titles that were available on the market. Consequently, the barriers to entry in the hardware market continued to escalate. A new entrant would have to have enough capital and clout in the marketplace in order to persuade third-party publishers to develop titles for its game library—a task that even the established players seemed to have trouble grappling with. Overall, this transition into a technologically advanced gaming format would prove to provide the impetus for a surge of innovation and creativity within the software sector of the video game industry.

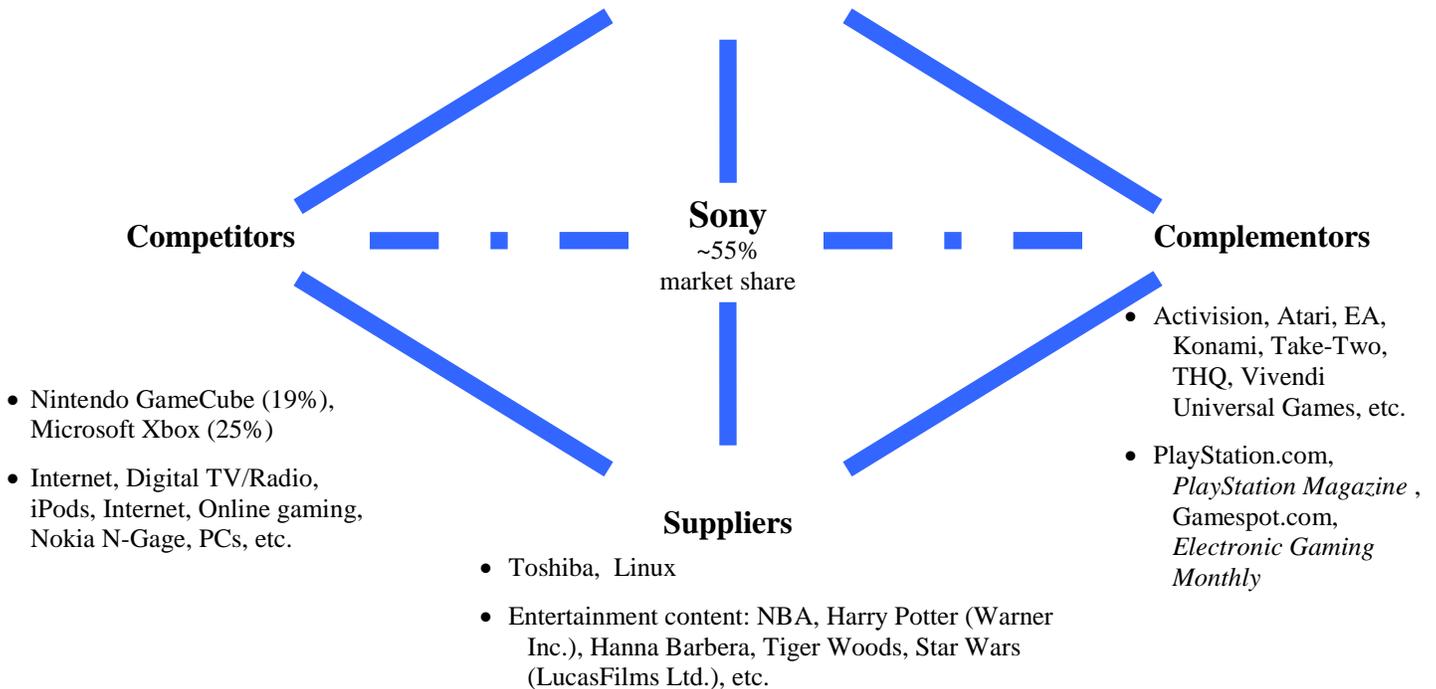
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<sup>9</sup> In fact in the fiscal year 3/00-2/01, Electronic Arts’ revenue of over \$770 million trounced that of its next closest competitor’s, Infogrames’, revenue tally of just barely \$469 million.

## 4.7 128-Bits (2000-Present)

### Customers

- Wal-Mart, Best Buy, GameStop, Target, Toys 'R' US, Electronics Boutique, Circuit City, etc.
- Target Demo: 16-24 Male; Secondary: 25+ Male



The current 128-bit generation of console systems has revolutionized the dynamics and prevalence of the video game industry in the U.S. Sony, Microsoft, and Nintendo stopped at nothing in order to establish their hardware platforms as the dominant console system and multimedia entertainment hub of this generation. Overarching trends of this hardware era include leaps of technological progress by hardware manufacturers and software publishers, dramatic increases in development costs of software titles, and a continued heavy reliance of software sales to drive console adoption.

Sony released its second generation console, the PlayStation 2 (PS2) in 2000, a year before its competitors. Among its strong points, Sony's dominance in the console battle resulted from its backwards compatibility abilities to play PS1 games. This backwards compatibility increased Sony's added value by providing PS2 with an instant library of software content upon its launch. Microsoft's technologically superior Xbox entered the home video game market in 2001 with an unheard of \$500 million marketing blitz and the support of over 200 dedicated third-party publishers. Microsoft slightly undercut Sony's royalty fees to its third-party publishers and was very aggressive in offering developers bonuses and advertising supplements for producing Xbox games. Nintendo's fourth generation of home consoles, the GameCube, was also launched in the U.S. in 2001. Although the GameCube did not possess backwards compatibility capabilities to play N64 games, Nintendo did finally switch over to the optical disk format of delivering its games. Each of these gaming consoles had the abilities (either with or without the assistance of add-on peripherals) to play video games, DVD movies, audio CDs, and connect to the internet. These multimedia capabilities increased the hardware manufacturers' added value as they provided a strong selling-point for the consoles without the aid of software publishers. However, as witnessed in previous home console generations, the increased competition among platform providers decreases the overall added value of the hardware manufacturers. If any one of the three dominant console systems was removed from the game, the remaining hardware manufacturing players would still be able to create (and divide amongst themselves) significant value despite the console's absence.<sup>f</sup>

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<sup>f</sup> In fact, that exact scenario occurred with Sega's 128-bit Dreamcast console. Sega released its final gaming console, the Dreamcast, in 1999. Its dismal sales (not even 3 million units in the U.S. over a 22 month period) and lack of third-party support caused Sega to cease Dreamcast's production and take itself out of the hardware market altogether in 2001. Sega changed gears and became a successful third-party publisher for the remaining hardware consoles.

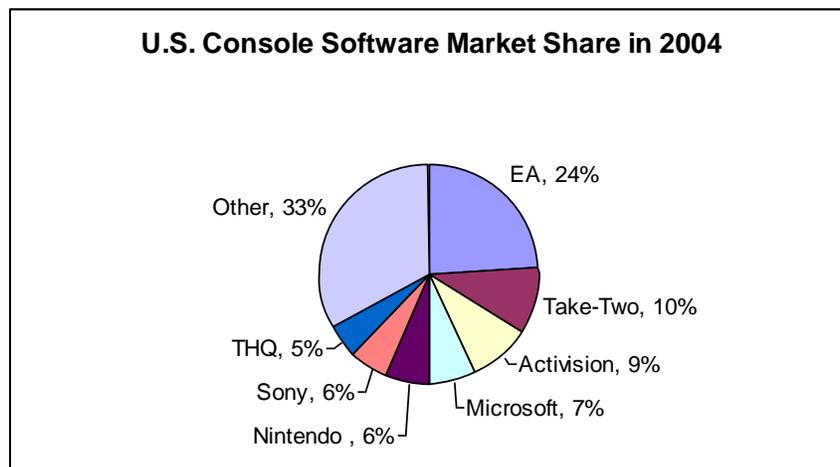
Today's games are delivered via DVD/proprietary optical disk format which can hold over four gigabytes of information. A tongue-in-cheek adage known as Parkinson's Law states that data expands to fill the space available for storage.<sup>24</sup> Essentially this means that as software medium's memory capacity increases, software publishers will create games that utilize more and more data space. Publishers are thus able to continuously make games more immersive, complex, and compelling—as well as more expensive to develop. For instance, video games in the 32/64-bit era were estimated to take an average of 6-12 months to develop and cost less than \$1 million to produce. By contrast, the average production time for a 128-bit gaming title is 12-24 months and can cost the upwards of \$4-\$8 million for top gaming titles. Publishers have to acquaint themselves with the new console's capabilities, complexities, and development challenges. These increased development costs raise the barriers of entry into the video game publishing market. This in turn increases the added value of the existing software publishers since platform providers have fewer software publishing alternatives to choose from. (This is barring the exception that hardware manufacturers develop a sufficient number of games in-house or use a "pay to play" strategy to bring new publishing firms into the market.)

Nevertheless, publishers must use strategic insight in order to overcome the challenges posed by the competitive landscape of the interactive software market. Publishers vie over coveted entertainment property licenses, retail promotion support, and shelf-space. In fact, content licensing has become such an important sales-driver in the video game industry that publishers are willing to pay hundreds of millions of dollars to secure popular intellectual property content. For example, in late 2004, publishing giant Electronic Arts signed an exclusive five-year agreement with the National Football League and its players union to use NFL players, teams, and stadiums in its games for a value reportedly exceeding \$300 million. Additionally,

each of the top ten grossing gaming title in 2003 was licensed from movies or other intellectual property.<sup>25</sup> These capital-intensive investments boost a publisher's probability of success. However, licenses for content average around \$7 per game, and for the most part, the world's top publishers already have control over the best licenses—once again boosting the added value of the publishing firms that have the support to expend such heavy investments.

This competitive environment has contributed to a recent trend of consolidation/acquisitions within the video game software market. Four publishers control over 50% of the market.<sup>26</sup> However, video game publishing is still relatively fragmented, with one-third of software revenues derived from publishers with less than 5% market share. Furthermore, the hardware manufacturers publish their own in-house proprietary software specific to their gaming console. These exclusive console-specific video game titles account for nearly 20% of the U.S. video game software revenues. *Figure 7* illustrates the U.S. console software market share in 2004.

**Figure 7:** <sup>27</sup>



The majority of consolidation activities have revolved around larger publishers acquiring smaller independent studios who find themselves in financial straits while developing games for the new

console generations. Consolidation is fueled primarily by an increase in competition and capital requirements, and the need to offer differentiated and compelling content. Software brand depth provides publishers with a base of steady, sequel-driven recurring revenues. For example, Take-Two Interactive has sold an estimated 32 million units of its *Grand Theft Auto* franchise. (This figure excludes its newest *GTA: San Andreas* release, which is expected to have a sales volume of an additional 12-15 million units.) Take-Two heavily relies on the attractive returns generated by predictable franchise sequels in what is otherwise a hit-driven business. However, Electronic Arts continues to dominate the market, evidenced by being the only publisher to have more than three brands to gross over \$47 million in the U.S. in 2003. (In fact, five of its gaming titles grossed over \$100 million and another three brands grossed over \$70 million.) Smaller publishing houses are finding it increasingly difficult to compete with these dominant publishing powerhouses. The consolidation of the software publishers has similar implications as the raised barriers to entry into the software market—both result in fewer players in the market, and therefore less bargaining power for hardware manufacturers. This therefore translates into a raised added value for those publishing firms that can withstand the increased costs of the market and yet still continue to develop quality gaming titles.

Software publishers continuously strive to establish strong franchise titles, maintain disciplined development operations, and use their power in the marketplace to bargain for superior margins and returns.

#### ***4.8 Implications for the Future of Gaming***

There is presently heavy speculation about the emergence of the next generation of hardware consoles. Sony, Microsoft, and Nintendo are all expected contenders, with Microsoft kicking things off with the launch of its new Xbox console slated for fall of 2005. (The other two

console releases are speculated to take place mid-2006). Each hardware manufacturer is said to have a slightly different strategy in order to maximize its added value in the marketplace. Sony's strategy is predicated upon the belief that it can make its console the central hub for home entertainment and technology applications.<sup>28</sup> On the other hand, Microsoft is more focused on the connectivity between its new console and the home PC, as it (not surprisingly) views PCs as the central hub of home networks. Either way, the console manufacturers will continue to compete in hopes of differentiating their consoles from each other in an attempt to increase their respective market share.

Each of the console's unique features (backwards compatibility, high-definition DVD capabilities, ancillary technological features, etc.) will increase its added value in the marketplace. Platform providers anticipate that these features will enable the consoles to appeal to a wider consumer base, and will attract new customers to the home video game console market. Therefore, not only will these technological advancements increase the overall value pie of the video game industry, they will also provide key additional sales drivers for the consoles. In other words, hardware manufacturers can tout their technologically-equipped versatile entertainment hubs as their primary selling point, as opposed to relying exclusively on their software library as their sole sales driver. We have yet to see whether this strategy will have implications on the platform providers' traditional "razors and blades" revenue model. While new consoles have generally been introduced to the market at the \$299 price point (in the 32/64-bit as well as the 128-bit eras), it is thought that these next-generation consoles will command an introductory price of \$399 because of their increased value offerings. Either way, the new generation of gaming consoles seems to be on target in terms of raising the platform providers' added value in the marketplace.

The launch of these new console systems has significant implications for third-party software publishers as well. The heightened appeal of these consoles will increase the industry's overall value, and therefore in theory increase the added value of the software publishers as well. After all, if more console units are being sold, software publishers are likely to do everything within their powers to more than match an increase in hardware sales with an increase in software sales. In contrast however, if platform providers attempt to distance themselves from software gaming titles as their primary sales driver, this could result in a decrease of the publishers' added value in the marketplace. Third-party software publishers run the risk of taking a backseat to the console's interactive versatility as the primary means of selling the next generation of hardware consoles to customers. (However, in all probability, hardware manufacturers will continue to heavily rely on third-party software publishers as their primary sales driver.)

The technological advancements in the forthcoming generation are once again expected to increase the required monetary and creative resources invested by developers and publishers to create gaming titles. It is speculated that Sony's gaming titles for its next-generation console will be delivered via a high-definition DVD format, which is said to hold anywhere from 30-50 *gigabytes* of data.<sup>5</sup> The costs of developing and marketing video games are expected to rise with technological and competitive pressures. Some speculate that the average production time for a next generation gaming title will be 24-36 months, and will cost the upwards of \$10-\$14 million. Once again, higher development costs raise the risk profile of gaming projects—particularly for small publishers—in what is a hit-driven industry. This implies that the move to the next generation of consoles will increasingly favor large game publishers and will continue to fuel the

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<sup>5</sup> There are currently two contending formats for the new technology standards of next-generation DVDs: Blu-ray and HD-DVD. The entertainment industry seems to be split down the middle in terms of their preferences.

trend of consolidation within the video game software sector. The steep barriers to entry in the software market will encourage acquisitions or drive small publishers out of the console market altogether as they find themselves unable to come up with the funding to stay in the game. Software-side consolidation will continue to propel the increase in added value of the dominant software publishers whose portfolios encompass big-hit gaming franchises and can neutralize the risky and unpredictable nature of the video game industry.

At the same time, industry expansion and technological developments will open up new opportunities to create more compelling gaming experiences for online, mobile, and other handheld gaming. By 2010 it is estimated that 450 million homes around the world will have broadband internet connectivity, and one-billion people will have access to packet-switched mobile phone connections that could support mobile games. Gaming titles will be released on these multiple platforms, and sequels to popular titles will continue to be increasingly common.<sup>29</sup> These technological expansions will allow for new and promising business-models and revenue streams based on subscriptions and pre-pay credits.

Mobile phones' emerging network technology will provide enough bandwidth to purchase and download mobile video games. The new generation of mobile phones will feature advanced processors, screen resolution, and audio quality that will support advanced mobile gaming. Other wireless technologies, such as Bluetooth, will also evolve and expand to enable players within ten meters to wirelessly compete against each other. Mobile gaming is especially attractive due to the low barriers of consumer participation; unique hardware is not required (most consumers already own mobile phones), and transaction costs are usually minimal compared to console or handheld games. While the next-generation 3G wireless networks are

first presently emerging, analysts estimate that the worldwide market for mobile games will reach \$7 billion by the end of 2005.

Similarly, online gaming via high speed broadband penetration will offer high quality multiplayer gameplay. Several massively multiplayer online role-playing games (MMOPRG) currently have a subscription base of over 400,000 gamers. This figure is estimated to leap to 10 *million* subscribers by the end of the decade. Experts forecast that the online gaming market will reach sales of \$1.3 billion by 2010. Online gaming's rapid growth is due to factors such as, an increased penetration of online-enabled consoles,<sup>t</sup> a rising number of games with online components, an evolving business model for online subscription fees, rapid geographic expansion, and partnerships between internet service providers and software publishers (for example, Electronic Arts' alliance with AOL's internet service).

Software publishers have only just begun to exploit online gaming's growing popularity.<sup>u</sup> Though it is possible that a percentage of these sales will cannibalize higher priced console game sales, it is thought that the aggregate increase will result in an overall incremental benefit to publishers.

Additionally, video game's widening demographic appeal and increased storage capacity will create new opportunities for in-game corporate advertising as a means to reach a niche target audience as publishers are creating games that appeal to consumers of various ages and abilities. The increasing popularity of online interactivity will enable advertisers to custom tailor their ads to specific gamers' profiles. Product placement and in-game advertisements, third-party ads on publishers' websites, and sponsorships of online gaming tournaments have already proven to be

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<sup>t</sup> Microsoft's web-connected Xbox Live currently charges \$69.99 for a starter kit plus an additional 12-month subscription fee for \$50.

<sup>u</sup> For example, Electronic Arts' estimated online gaming revenue for Fiscal 2004 only accounted for approximately 2% of total net sales.

profitable for software publishers. It is estimated that advertising will contribute \$25-\$30 million in revenues in fiscal 2005, but could grow at as much as a 50% rate over the next few years as online play increases and advertisers become increasingly concerned about losing television viewers to the video game industry.<sup>30</sup> Software publishers will therefore raise their added value by gaining access to new opportunities for sales and distribution—among both mobile phone and internet providers—and hence rely less exclusively on home console manufacturers as their primary means of revenues.

Overall, the video game industry continues to thrive at the leading edge of technological development. Hardware manufacturers and software publishers must continually monitor the industry's landscape and anticipate and prepare for dramatic shifts in technology and consumer demand.

## **5. Implications, Limitations, and Further Research**

As we have seen, the third-party publishers have transformed from an essentially underappreciated commodity in the 8-bit generation, to an industry-leading powerhouse on near-equal footing with the hardware manufacturers in the current 128-bit generation. This analysis indicates the importance of analytical mapping of one's surroundings when making strategic decisions in the marketplace. It enables a firm to develop more sound and in-depth strategies in order to capture a larger piece of the value pie as interdependencies and relationships among players constantly shift. For instance, if Sega and Nintendo were both more acutely aware of the software publishers' growing importance and bargaining power throughout the 32/64-bit generation, might Nintendo have switched to a CD-based software format sooner, or Sega have made its Saturn more user-friendly to program?

Although the answers are not clear, hardware manufacturers could utilize these analyses in order to prepare for future-generation negotiations and interactions with software publishers. Perhaps the platform providers will offer substantially more appealing licensing agreements in order to appease the software publishers. By contrast, perhaps the console manufacturers' strategies to become the home technology entertainment-hub indicate that they are beginning to distance themselves from the publishing houses in order to pursue other sales-drivers for their respective consoles. Even further, perhaps the trends of consolidation and new potential revenue streams for software publishers will provide an impetus for the dominant platform providers to acquire and integrate third-party publishing houses into their own in-house operations.

Additionally, new players to the market can use these analytical methods in an effort to detect profitable white space in the marketplace, while current dominant players can continue to monitor the industry's landscape in an effort to guard their market share. For instance, mobile phone providers can trace the evolution and implications of dominant hardware consoles, handheld gaming systems, and shift in game-delivery formats from cartridges to optical disks over successive hardware generations. This will enable mobile phone manufacturers and/or service providers to form well-developed strategies for mobile gaming and ascertain whether (and when) the video game market is ready to move significantly into the domain of wireless interactive gaming. Similarly, today's console manufacturers must be wary of threatening consumer electronic manufacturers and PC companies that are competing with similar "digital entertainment" strategies in the marketplace. Awareness, understanding, and in-depth knowledge of the intricate dynamics of an industry are the first steps in achieving ultimate success. It is therefore important to note the strategic benefits in mapping out the constantly shifting trends of the industry and how the players interact.

Further research could be pursued by continually monitoring the interdependencies and relationships within the video game industry. Unfortunately, it proved to be exceedingly difficult to collect ample and adequate sales, licensing rights, and historical video game data. Our analyses could have encompassed a wider range of the interrelationships and interactions between the hardware manufacturers and software publishers if we were privy to such proprietary data. Furthermore, this paper touched solely upon the interactions between the hardware manufacturers and the software publishers within the video game industry. A strategic analysis of other interrelationships as mapped out in the firms' Value Nets would prove quite insightful to study in depth.

## **6. Conclusion**

As we have seen, each successive home console generation has brought forth a wave of change that has altered the dynamics of the video game industry. As the video game market matured, it has transitioned from a Nintendo-dominated monopolistic landscape to an oligopoly with Sony positioned as market share leader. More interestingly, we have examined the emergence of the software publishers as a major contender for power and value within the video game market. We have cited a steady incremental increase in the competitive dynamics and in the equalization of bargaining power between the traditionally dominant hardware manufacturers and the recently empowered (and steadily growing) software publishers.

This paper has suggested the use of strategic analysis as an approach to examine the interactions and interdependencies among the members of the video game industry. We used Game Theory's analytical tools of Value Nets and added value to map out the dually complementary as well as competitive nature of the relationship between video game hardware

manufacturers and third-party software publishers. These two dominant players work together in order to create value, yet reveal competitive attributes over how the value is divided. Overall, as we have seen, increases in the competitive rivalry among the platform providers, soaring software development costs, and incredible technological advancements are some of the factors that have propelled the increased added value and profitability of the third-party software publishers. Though it is not quite clear what the future of gaming will bring or how it will impact the shifting dynamics between these two players, the analytical framework presented in this paper can be used to monitor these trends and aid in the strategic decision-making among the key players in the industry.

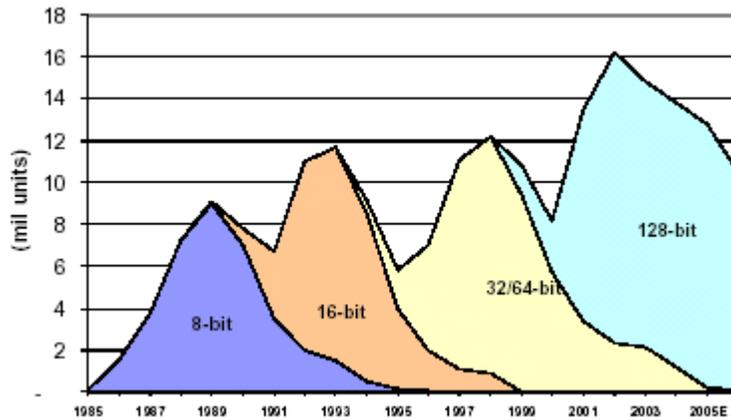
## Appendix A

**Exhibit 1: The Technical Advancements of Video Game Consoles <sup>v</sup>**

<i>System</i>	<i>Launch Date</i>	<i>Data Width</i>	<i>Microprocessor</i>	<i>Clock Speed</i>	<i>RAM</i>	<i>Software Medium</i>
<b>Nintendo Entertainment System</b>	1985	8-Bit	6502	1.79 MHz	2 KB	8 KB ROM on cartridge
<b>Super Nintendo Entertainment System</b>	1991	16-Bit	65C816	1.79 to 3.58 MHz (variable)	128 KB	2 – 64 MB on cartridge
<b>Sony PlayStation</b>	1994	32-Bit	RISC (R3000A)	33.87 MHz	2 MB	32 Kilobytes on CD
<b>Nintendo 64</b>	1996	64-Bit	RISC (customized R4000 series)	93.75 MHz	36 Mbits	32 – 512 megabit cartridge
<b>Sony PS2</b>	2000	128-Bit	"Emotion Engine" RISC (MIPS IV subset)	294.9 MHz	32MB	4.7 GB DVD and PS1 CDs
<b>Microsoft XBox</b>	2001	128-Bit	Intel Pentium III	733 MHz	64 MB	4.7 GB DVD

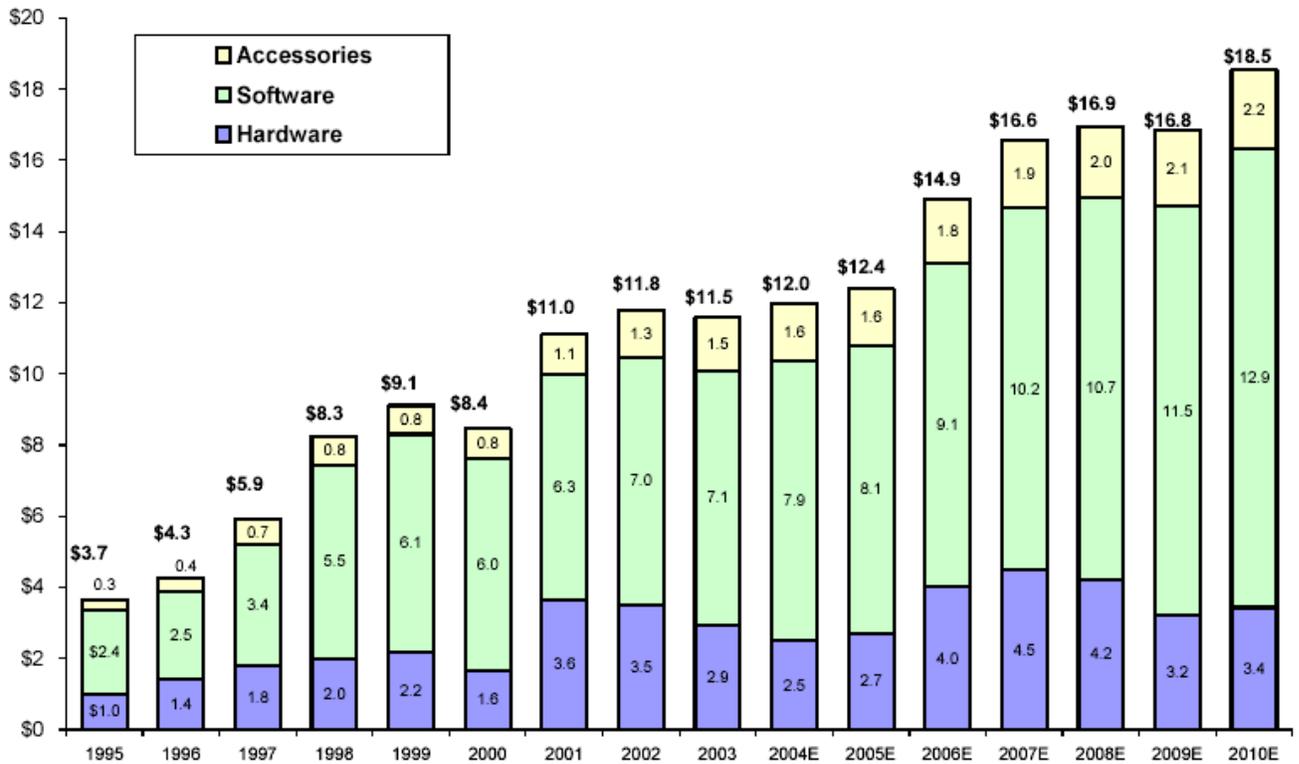
<sup>v</sup> Adapted from: Igal Brightman, et al. "Moore's Law and electronic games: How technology advances will take electronic games everywhere." *Deloitte Technology Media & Telecommunications*. p7, 2 June 2004. (3 February 2005).

**Exhibit 2: U.S. Video Game Hardware Cycle** <sup>31</sup>

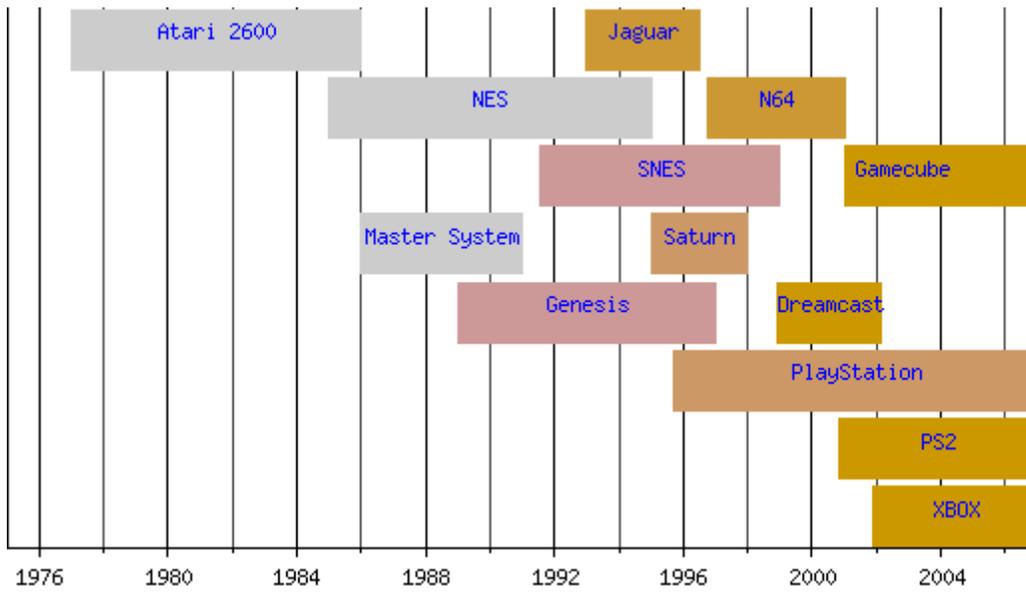


**Exhibit 3: Total U.S. Video Game Industry Physical Product Sales, 1995-2003** <sup>32</sup>

(\$ in billions)



**Exhibit 4: Timeline of U.S. Video Game Consoles<sup>33</sup> (1977-2005)**



## Appendix B: (Video) Game Theory's Keys to Success

In a many ways, the storyline of a firm's success in the business environment parallels that of a video game character in its virtual digital world. Each "protagonist" is on a quest for ultimate success (profitability, market-share, etc.), while concurrently making allies (from strong and profitable business relationships) and defeating evil enemies (crushing the competition) along the way.

However, in reality, the game of business revolves around the notion of *value*—how it is created, and in turn, how it is divided in the marketplace. Two key analytical tools, 'Value Nets' and 'Added Value,' will allow us examine how players of the game come together and cooperate in order to create value and how they rival and compete in order to divide that same value.

### **B.1 Value Nets<sup>w</sup>**

A Value Net is a schematic map of the interactions and interdependencies among all the players in the game. The players in the game include all entities that a firm might interact with while creating and dividing value within the marketplace—namely, suppliers, customers, competitors and complementors. As one can see from *Figure B.1*, customers and suppliers interact on the vertical dimension, while competitors and complementors interact on the horizontal dimension. Along the vertical dimension a firm transacts with suppliers in order to acquire resources such as raw material and labor, and in turn uses those resources to produce products or services that are then utilized/purchased by the firm's customers. Therefore, resources and products/services flow from the suppliers to the firm and from the firm to the

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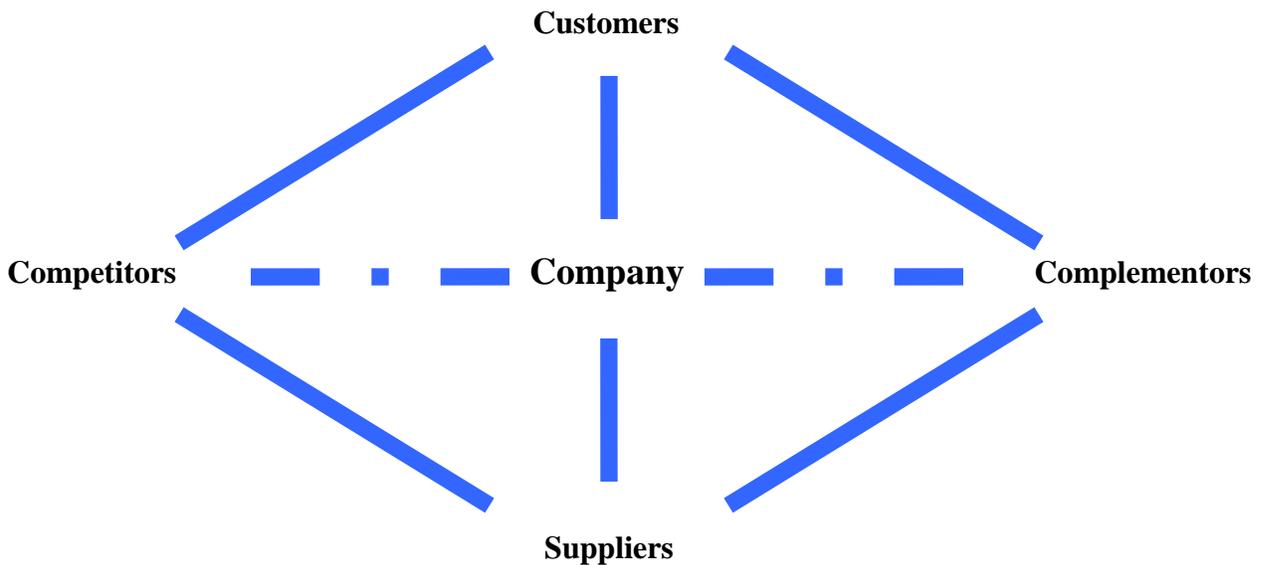
<sup>w</sup> Refer to Brandenburger and Nalebuff's *Co-opetition* (Doubleday, 1996), for an in-depth and engaging analysis/approach to strategic business thinking and the fine balance between competition and cooperation within the game of business.

customers. Simultaneously, money flows from the customers to the firm and from the firm to its suppliers.

Along the horizontal dimension, competitors can be defined as any alternative players whose presence causes customers to value your product or service *less* than they would if your competitor was not in the market. In the simplest of senses, Ivory Soap and Lever2000 are prime examples of competitors. If you already possess a bar of Lever2000 soap, you'd probably value Ivory Soap a lot *less* than if you didn't already have a bar of soap to use for cleansing purposes. Competitors represent an alternative means of acquiring your sought-after benefit.

On the other side of the horizontal dimension are a firm's complementors. A player is your complementor if customers value your product *more* when they have the other player's product than when they have your product alone.<sup>34</sup> In other words, complementors are players who create complements for the firm's goods or services, which in turn make the firm's original product/service more attractive to possess. Computer hardware and software are complements, as are tuna fish and mayonnaise, or a razor and shaving cream. Each of the complementors makes the original product more attractive and valuable to possess.

**Figure B.1: The Value Net**



The Value Net represents the symmetries between the players in each of the two dimensions. The firm must come together with customers and suppliers in the overall production and distribution process in order to create value in the marketplace. Additionally, along the horizontal dimension, the firm must carefully monitor its competitors and be sure not to overlook the importance of its complementors in order to take away a maximum amount of value from the game. One must also recognize that competitors are not always necessarily a firm's enemies, just as complementors are not always necessarily a firm's friend. For instance, a firm might work in conjunction with its competitor in order to build complements or in order to attract a wider audience base. At the same time, even though complementors may increase the overall value pie of the business situation, oftentimes there is a battle over who is going to be the main beneficiary of their relationship. (This is the exact situation that is seen in the video game industry between hardware manufacturers and software publishers.)

Similarly, it is important to note that a player in one's value net need not be assigned to only one specific role/position within the game. After all, each categorical assignment of

customer, supplier, competitor, and complementor is just that—a role. An entity can play several roles within the context of business interactions. For instance, an entity can simultaneously be a competitor and complementor. American Airlines and Delta are competitors—each vies for passengers, airspace, airport gates, and landing slots. However, looking beyond their competitive rivalry we can see that they are complementors as well within the airline industry. They complement each other when commissioning Boeing to build a new plane. Similarly, competing Broadway shows in Manhattan can be seen as both competitors—as they are rival for patrons—and complementors—as they work in tangent to create an appealing and tourist-enticing environment in NYC. Therefore, we can see that certain firms in a company’s Value Net are both complementors while collectively creating a market and competitors while dividing the market.

Overall, once a firm’s Value Net maps out the interdependencies among the players of the game, it can then examine how value is created—and more importantly—how value is divided among its members. We can then develop a firmer grasp on which strategic decisions would be most beneficial for the future of the firm. We can also determine whether the firm is exploiting all its potential value-creating transactions through its interactions and relationships with the other players in the game. We will see that ascertaining a player’s added value will help in such an analysis.

## **B.2 Added Value<sup>x</sup>**

Added value refers to a player’s marginal contribution (or incremental benefit brought) to the game. In other words, added value is the amount by which the overall value created would

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<sup>x</sup> See Brandenburger and Stuart’s *Value Based Business Strategy* (Journal of Economics and Management Strategy, 1996), as well as Brandenburger and Nalebuff’s *Co-opetition* (Doubleday, 1996), for a thorough, complete, and easily digestible analysis of ‘added value’ in the business context.

shrink if the player in question were to leave the game.<sup>35</sup> In formulaic terms, added value can be thought of as:

added value of a player

= value created when *all* players are present in the game

— value created when all players *except* for the player in question are present in the game.

Added value is what *you* bring to the game. Therefore, a fair assumption would lie in the fact that a player can capture an amount of value that is no greater than that player's own added value. After all, if a player were to capture an excess of his own added value that would imply that the value captured by the remaining players would have to be less than what they had collectively brought to the game together in the first place. In other words, this means that the remaining players would have missed out on a favorable deal that they could have struck among themselves.<sup>36</sup>

A firm aims to maximize its added value in order to secure a more powerful position in the marketplace. Intuitively, this can be done by either raising the firm's own added value or lowering the added value of others in the game. Among other tactics, a firm can increase its added value by:

- Differentiating itself in the marketplace (*i.e.*, if a firm has a differentiated product/service its consumers would be more cognizant of the fact that it has left the game). A firm can do this by providing a superior product to its customers or by building a solid and memorable brand. For example, if Coca-Cola left the soft drink industry then consumers would still have Pepsi and other generic colas to choose from. However, Coca-Cola has built up a loyal consumer base to its brand that would be sure to notice Coke's absence in the marketplace. Therefore, Coca-Cola has raised its added value.

- Developing a relationship with its customers (*i.e.*, a firm can implement loyalty programs such as frequent flyer miles or “buy ten, get one free” punch-cards). These programs raise the added value for a firm and enhance consumer loyalty by enticing them to do repeat-business—all at a minimal cost for the firm.
- Cutting costs and using resources more efficiently—a firm should lower its production costs in a way that helps it deliver a better product; similarly, a firm should deliver a better product in a way that helps to lower its costs. Additionally, a firm should attempt to raise the amount that consumers are willing to pay by an amount that exceeds the incremental costs incurred by the firm to develop a better product; similarly, a firm should attempt to reduce its production costs without reducing the consumer’s willingness to pay as much.<sup>37</sup>

One must be careful not to confuse the added value of a particular entity with the added value of an entire sector or industry. For example, the added value of commercial airlines is quite large—without airlines we would be stuck back in the world of road and sea-travel. However, that does not mean that American Airlines has equally as large of an added value as the entire airlines industry. If American Airlines was removed from the ‘game,’ a passenger would still be able to secure air-transport via Delta, Continental, Southwest, or an entire list of other commercial airlines. Therefore, it is important not to assign an entire industry’s added value to one specific entity within that industry. (However, this rule changes in the case of a firm’s monopoly power over an entire industry. In that case the firm generally *does* hold the entire added value of the industry and if it were removed then there would be no value left to capture.)

Added value is not necessarily a quantifiable analytical tool. However, examining a firm’s added value assists in evaluating the strength of its position in its industry and aids in the decision-making process and implementation of strategic moves within the marketplace.

### ***B.3 Strategic Implications:***

Value Nets and added value are analytical tools that should be incorporated into the process of one's strategic decision making and the way one thinks of how the game of business is played. It allows a firm to take a step back from the constraints of its immediate situation and enables the firm to examine the broader contextual landscape and the potential value and rewards that are currently unexploited. After all, what you don't see, you can't capture or change.

It is important to note that this analytical mindset is a dynamic and constant progression. Interdependencies and relationships among players are constantly shifting as the game progresses. No matter how successfully a firm has seized current opportunities (or thwarted current challenges), new ones will surely emerge which can be captured (or swiftly defeated) to the fullest extent by adapting to the changes of the game—or by proactively changing the game yourself.

Mapping out interrelationships and added values also allows a firm to evaluate the current situation from the perspective of all the other players of the game. It gives the firm a better feel and insight for how other players will react to a change in the business landscape or a particular strategic move. A firm must also constantly monitor the movements of the other players in the game, the ways in which they try to alter how value is captured, and the ways in which they interact.

These strategies will enable players to break away from the traditional mindset of the strict roles, positions, and supposed implications and strategic tactics that are assumed and accepted during the course of business. Players will better understand how value is collectively created and how it is competitively divided. They will be driven to develop richer and more dependable strategies in order to capture a larger piece of the value pie.

Overall, these strategic tools help us to answer the following questions:<sup>38</sup>

- Who are the players in the game?
- What are the opportunities for cooperation and competition among your customers, suppliers, competitors, and complementors?
- Would it be beneficial to bring new players into the game?
- How will the other players and the game itself be affected if you leave the game?
- How can you increase your own added value?
- What are the added values of the other players in the game? Is it in your best interest to limit their added value?

## Appendix C

### Exhibit 1: Title Economics of Typical Games

	<b>Scenario A</b>	<b>Scenario B</b>	<b>Scenario C</b>
	“Disappointing Seller”	“Strong Seller”	“Home Run”
Retail Price (Debut)	\$50.00	\$50.00	\$50.00
Wholesale Price (Debut)	\$40.00	\$40.00	\$40.00
Retail Price (After Reduction)	\$30.00	\$40.00	\$40.00
Wholesale Price (After Reduction)	\$24.00	\$32.00	\$32.00
Total Units Sold	500,000	1,500,000	4,000,000
Gross Revenue to Publisher	<b>\$16,800,000</b>	<b>\$56,400,000</b>	<b>\$150,400,000</b>
R&D	\$8,000,000	\$10,000,000	\$12,000,000
Developer Royalties	\$1,680,000	\$7,050,000	\$18,800,000
Licensing	\$2,520,000	\$8,460,000	\$22,560,000
Hardware Royalty Payment & Disc Production	\$5,000,000	\$13,500,000	\$36,000,000
Marketing Expense	\$6,000,000	\$10,000,000	\$15,000,000
<b>Licensed Games</b>			
Total Title Cost	<b>\$21,520,000</b>	<b>\$41,960,000</b>	<b>\$85,560,000</b>
Lifetime Profit	<b>(\$4,720,000)</b>	<b>\$14,440,000</b>	<b>\$64,840,000</b>
<b>Lifetime Profit Margin</b>	(28.1)%	25.6%	43.1%
<b>Owned Intellectual Property Game</b>			
Total Title Cost	<b>\$19,000,000</b>	<b>\$33,500,000</b>	<b>\$63,000,000</b>
Lifetime Profit	<b>(\$2,200,000)</b>	<b>\$22,900,000</b>	<b>\$87,400,000</b>
<b>Lifetime Profit Margin</b>	(13.1)%	40.6%	58.1%
<b>ROI in R&amp;D and Marketing</b>			
Licensed Game	(33.7)%	72.2%	240.1%
Owned Intellectual Prop. Game	(15.7)%	114.5%	323.7%

**Exhibit 2: Title Economics of Typical Games—Per Unit basis**

	<b>Scenario A</b>	<b>Scenario B</b>	<b>Scenario C</b>
	“Disappointing Seller”	“Strong Seller”	“Home Run”
<b>Retail Price (Debut)</b>	\$50.00	\$50.00	\$50.00
<b>Wholesale Price (Debut)</b>	\$40.00	\$40.00	\$40.00
<b>Retail Price (After Reduction)</b>	\$30.00	\$40.00	\$40.00
<b>Wholesale Price (After Reduction)</b>	\$24.00	\$32.00	\$32.00
<b>Total Units Sold</b>	500,000	1,500,000	4,000,000
<b>Gross Revenue to Publisher</b>	<b>\$16,800,000</b>	<b>\$56,400,000</b>	<b>\$150,400,000</b>
<b>R&amp;D per unit</b>	\$16.00	\$6.67	\$3.00
<i>R&amp;D as % of sales</i>	48%	18%	8%
<b>Developer Royalties per unit</b>	\$3.36	\$4.70	\$4.70
<i>Developer Royalties as % of sales</i>	10%	12.5%	12.5%
<b>Licensing Cost per unit</b>	\$5.04	\$5.64	\$5.64
<i>Licensing as % of sales</i>	15%	15%	15%
<b>Hardware Royalty Payment &amp; Disc Production per unit</b>	\$10.00	\$9.00	\$9.00
<i>Hardware Royalty Payment &amp; Disc Production as % of sales</i>	30%	24%	24%
<b>Marketing Expense per unit</b>	\$12.00	\$6.67	\$3.75
<i>Marketing Expense as % of sales</i>	36%	18%	10%
<b>Licensed Games</b>			
Total Title Cost Per Unit	<b>\$31.04</b>	<b>\$21.31</b>	<b>\$17.64</b>
Lifetime Profit Per Unit	<b>(\$3.04)</b>	<b>\$12.03</b>	<b>\$18.61</b>
<b>Owned Intellectual Property Game</b>			
Total Title Cost Per Unit	<b>\$26.00</b>	<b>\$15.67</b>	<b>\$12.00</b>
Lifetime Profit Per Unit	<b>\$2.00</b>	<b>\$17.67</b>	<b>\$24.25</b>

## Endnotes

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- <sup>1</sup> Adam Brandenburger, *Power Play (A): Nintendo in 8-Bit Video Games*, Harvard Business School Case 795-102, 1995.
- <sup>2</sup> Simon Tsang, "Let the Games Begin," *Icon; TheAge.com*, September 13, 2003, <<http://www.theage.com.au/articles/2003/09/12/1063341761629.html?from=storyrhs&oneclick=true>>
- <sup>3</sup> Leonard Herman, "The History of Video Game Compatibility," *GameSpot.com*, 2001. <[http://www.gamespot.com/gamespot/features/video/hov/p9\\_01.html](http://www.gamespot.com/gamespot/features/video/hov/p9_01.html)>
- <sup>4</sup> Peter J. Coughlan, *Note on Home Video Game Technology and Industry Structure (Abridged)*, Harvard Business School Case 9-704-488, 2004.
- <sup>5</sup> Glen R. Reid, and Joseph Holland. "Interactive Entertainment: Games Grow Up: A Guide for Investors." *Bear Sterns Equity Research*, p11, February 2005. Investext Plus. (25 February 2005).
- <sup>6</sup> "Essential Facts About the Computer and Video Game Industry," *Entertainment Software Association*. <<http://www.theesa.com/pressroom.html>> (23 February 2005).
- <sup>7</sup> Reid and Holland. p14.
- <sup>8</sup> Michael Patcher, and Edward Woo. "The Definition of Insanity: Why The Next Console Cycle Will Start Off With A Whimper: An In-Depth Look at Interactive Entertainment Software." *Wedbush Morgan Securities Equity Research; Consumer Products & Services: Entertainment Software Publishing and Retail Industry Report*. p12, Los Angeles, June 2004. (9 February 2005).
- <sup>9</sup> Arvind Bhatia and Melinda Krenek. "Interactive Software Entertainment." *Southwest Securities Industry Report*, p11, Fall 2000. Investext Plus (24 January 2005).
- <sup>10</sup> Patcher and Woo, p12.
- <sup>11</sup> Anthony N. Gikas and Stephanie M. Wissink. "The Video Game Industry Primer." *U.S. Bancorp Piper Jaffray: Equity Research*; p 2 Minneapolis: May 2004. Investext Plus. (11 December 2004).
- <sup>12</sup> "Fact Sheet: Media Use." *National Institute on Media and the Family*. <[http://www.mediafamily.org/facts/facts\\_mediause.shtml](http://www.mediafamily.org/facts/facts_mediause.shtml)> (13 February 2005).
- <sup>13</sup> Stuart Elliot and Bill Carter, "Nielsen Offers More Details on Lost Viewers," *New York Times*, December 21, 2003.
- <sup>14</sup> Jonathan Dee, "Playing Mogul," *New York Times*, December 21, 2003.
- <sup>15</sup> "Essential Facts About the Computer and Video Game Industry," *Entertainment Software Association*, <<http://www.theesa.com/pressroom.html>> (23 February 2005).
- <sup>16</sup> Gikas and Wissink, p4.
- <sup>17</sup> Patcher and Woo, p19.
- <sup>18</sup> Igal Brightman, et al. "Moore's Law and electronic games: How technology advances will take electronic games everywhere." *Deloitte Technology Media & Telecommunications*. p6, 2 June 2004. (3 February 2005).
- <sup>19</sup> Patcher and Woo, p22.
- <sup>20</sup> Patcher and Woo, p19.

- 
- <sup>21</sup> Adam M Brandenburger and Barry J. Nalebuff, *Co-opetition: A Revolution Mindset That Combines Competition and Cooperation: The Game Theory Strategy That's Changing the Game of Business*. (New York: Currency Doubleday, 1996) p18.
- <sup>22</sup> Leonard Brecken, "The Video Game Market," *Oppenheimer & Co., Inc.* p4, 1 November 1993. Investext Plus.( 13 January 2005).
- <sup>23</sup> Bhatia and Krenek, p47.
- <sup>24</sup> Brightman, p7.
- <sup>25</sup> May Wong, "Hollywood Interest in Video Games Grows," *xPosed*, May 2004;; AP Technology, May 16, 2004, San Jose, CA. < [http://m3.typepad.com/hla/2004/05/hollywood\\_inter.html](http://m3.typepad.com/hla/2004/05/hollywood_inter.html)>
- <sup>26</sup> Elizabeth Osur, "Video Game Publisher Initiation: The Right Place at the Right Time," *Citigroup Smith Barney Equity research: United Sates, Leisure Products*. p52, 22 December 2004. Investext Plus. (10 January 2005).
- <sup>27</sup> Reid and Holland, p10.
- <sup>28</sup> Osur, p63.
- <sup>29</sup> Content of paragraph adapted from: Brightman, p2-10.
- <sup>30</sup> Osur, p105.
- <sup>31</sup> Patcher and Woo, p21.
- <sup>32</sup> Osur, p57.
- <sup>33</sup> "Video Game Console," *Wikipedia, The free encyclopedia*. <[http://en.wikipedia.org/wiki/Video\\_game\\_console](http://en.wikipedia.org/wiki/Video_game_console)> (23 January 2005).
- <sup>34</sup> Brandenburger and Nalebuff, 18.
- <sup>35</sup> Adam M. Brandenburger, class tutorial, 18 February 2005.
- <sup>36</sup> Adam M Brandenburger and Harborne W. Stuart, Jr, "Value-Based Business Strategy," *Journal of Economics & Management Strategy*, Vol 5, Number 1, p13, Spring 1995, 5-24.
- <sup>37</sup> Brandenburger and Nalebuff, p131.
- <sup>38</sup> Brandenburger and Nalebuff, p262.

---

## Bibliography

- Argyres, Nicholas, and Anita M. McGahan. "An interview with Michael Porter." *Academy of Management Executive*; May2002, Vol. 16 Issue 2, p43. Business Source Premier. (27 March 2005).
- Beck, John C., and Mitchell Wade. *Got Game: How the Gamer Generation is Reshaping Business Forever*. Boston, Massachusetts: Harvard Business School Press, 2004.
- Bhatia, Arvind, and Melinda Krenek. "Interactive Software Entertainment." *Southwest Securities Industry Report*, Fall 2000. Investext Plus (24 January 2005).
- Brandenburger, Adam M. "Knowledge and Equilibrium in Games." *Journal of Economic Perspectives*; Fall92, Vol. 6 Issue 4, p83. Business Source Premier. (27 March 2005).
- Brandenburger, Adam M. "Porter's added value: High indeed!" *Academy of Management Executive*; May2002, Vol. 16 Issue 2, p58. Business Source Premier. (27 March 2005).
- Brandenburger, Adam M., and Barry J. Nalebuff. *Co-opetition: A Revolution Mindset That Combines Competition and Cooperation: The Game Theory Strategy That's Changing the Game of Business*. New York: Currency Doubleday, 1996.
- Brandenburger, Adam M. *Power Play (A): Nintendo in 8-bit Video Games*, Harvard Business School Case 9-795-102. Boston, Massachusetts: Harvard Business School Publishing, 12 July 1995.
- Brandenburger, Adam M. *Power Play (B): Sega in 16-bit Video Games*, Harvard Business School Case 9-795-103. Boston, Massachusetts: Harvard Business School Publishing, 12 July 1995.
- Brandenburger, Adam M. "Technical Note on Cooperative Game Theory: Characteristic Functions, Allocations, Marginal Contribution." Version 12/05/02. <<http://pages.stern.nyu.edu/%7Eabranden/TeachingMaterials.htm>> (15 March 2005).
- Brandenburger, Adam M. "Technical Note on Cooperative Game Theory: The Core" Version 12/05/02. <<http://pages.stern.nyu.edu/%7Eabranden/TeachingMaterials.htm>> (15 March 2005).
- Brandenburger, Adam M., and Harborne W. Stuart, Jr. "Value-Based Business Strategy." *Journal of Economics & Management Strategy*, Vol 5, Number 1, Spring 1995, 5-24.
- Brandenburger, Adam M., and Barry J. Nalebuff. "The Right Game: Use Game Theory to Shape Strategy." *Harvard Business Review*; Jul/Aug95, Vol. 73 Issue 4, p57. Business Source Premier. (27 March 2005).

- 
- Brecken, Leonard. "The Video Game Market." *Oppenheimer & Co., Inc.* 1 November 1993. Investext Plus. (13 January 2005).
- Brightman, Igal, et al. "Moore's Law and electronic games: How technology advances will take electronic games everywhere." *Deloitte Technology Media & Telecommunications*. 2 June 2004. <[http://www.deloitte.com/dtt/press\\_release/0,1014,sid%253D3647%2526cid%253D50468,00.html](http://www.deloitte.com/dtt/press_release/0,1014,sid%253D3647%2526cid%253D50468,00.html)> (3 February 2005).
- Burnham, Van. *Supercade: A Visual History of the Videogame Age 1971-1984*, Cambridge: MIT Press, 2001.
- Chen, Jason Chou-Hong, P. Pete Chong, and Ye-Sho Chen. "Decision Criteria Consolidation: A Theoretical Foundation of Pareto Principle to Porter's Competitive Forces." *Journal of Organizational Computing & Electronic Commerce*; 2001, Vol. 11 Issue 1, p1. Business Source Premier. (27 March 2005).
- Cohen, Scott. *Zap! The Rise and Fall of Atari*. New York: McGraw-Hill Book Company, 1984.
- Cole, David. "DFC Intelligence Releases New Market Forecasts For Video Game Industry." *DFC Intelligence*. 22 September 2004. <<http://www.dfcint.com/news/prsep222004.html>> (26 April 2005).
- Coughlan, Peter J. *Note on Home Video Game Technology and Industry Structure (Abridged)*, Harvard Business School Case 9-704-488. Boston, Massachusetts: Harvard Business School Publishing, 5 November 2004.
- Coughlan, Peter J. *The Golden Age of Home Video Games: From the Reign of Atari to the Rise of Nintendo*, Harvard Business School Case 9-704-487. Boston, Massachusetts: Harvard Business School Publishing, 5 November 2004.
- Dee, Jonathan. "Playing Mogul." *New York Times Magazine*; p36, 21 December 2003.
- Elalouf, Eric, et al. "The Video Game Industry: Game over or extended play?" *Deutsche Bank Global Equity Research*. 11 January 2002. Investext Plus. (4 February 2005).
- Elliot, Stuart and Bill Carter. "Nielsen Offers More Details on Lost Viewers." *New York Times*, December 21, 2003.
- "Essential Facts About the Computer and Video Game Industry." *Entertainment Software Association*, <<http://www.theesa.com/pressroom.html>> (23 February 2005).
- Gikas, Anthony N., and Stephanie S. Wissink. "Toy & Video Game Primer." *U.S. Bancorp Piper Jaffray: Equity Research*; Minneapolis: November 2003. Investext Plus. (23 January 2005).

- 
- Gikas, Anthony N., and Stephanie S. Wissink. "The Video Game Industry Primer." *U.S. Bancorp Piper Jaffray: Equity Research*; Minneapolis: May 2004. Investext Plus. (11 December 2004).
- Gordon, R.M. "Playing to Win." *Marketing Management*; Summer 96, Vol. 5 Issue 2, p67. Business Source Premier. (27 March 2005).
- Hammonds, Keith H. "Michael Porter's Big Ideas." *Fast Company*; March2001 Issue 44, p150. Business Source Premier. (27 March 2005).
- Hareng, Bruno, and Lisa Spicer. "Video games: Not just for kids." *ING Financial Markets: Equity Markets*. July 2002. Investext Plus. (11 December 2004).
- Hartwig, Robert J. "Cooperative and Competition: A Comparative Review." *Journal of Business & Economic Studies*; Fall98, Vol. 4 Issue 2, p71. Business Source Premier. (27 March 2005).
- Herman, Leonard. "The History of Video Game Compatibility." *GameSpot.com*. 2001. <[http://www.gamespot.com/gamespot/features/video/hov/p9\\_01.html](http://www.gamespot.com/gamespot/features/video/hov/p9_01.html)>
- Kent, Steven L. *The Ultimate History of Video Games: From Pong to Pokemon—The Story Behind the Craze that Touched Our Lives and Changed the World*. New York: Random House/Prima, 2001.
- Klein, Lawrence. "Looking for Complements." *NZ Marketing Magazine*; Jul98, Vol. 17 Issue 6, p36. Business Source Premier. (27 March 2005).
- Lin, James L. "Hardware Trends-Part 1L Dedicated Video Games Console Systems." *Wedbush Morgan Securities: Equity Research; Technology: Entertainment Software & Media*. 25 August 1997. Investext Plus. (14 February 2005).
- Lin, James L., and Linny Cendana. "Interactive Entertainment Software: Video Game Evolution?" *Jefferies & Company, Inc. Equity Research*, November 2002. Investext Plus. (17 February 2005).
- Nalebuff, Barry J., and Adam M. Brandenburger. "Co-opetition: Competitive and cooperative business strategies for the digital economy." *Strategy & Leadership*; Nov/Dec97m Vol. 25 Issue 6, p28. Business Source Premier. (27 March 2005).
- Nathan, John. *Sony: The Private Life*. New York: Houghton Mifflin Company, 1999.
- "Fact Sheet: Media Use." *National Institute on Media and the Family*. <[http://www.mediafamily.org/facts/facts\\_mediause.shtml](http://www.mediafamily.org/facts/facts_mediause.shtml)> (13 February 2005).

- 
- Osur, Elizabeth. "Video Game Publisher Initiation: The Right Place at the Right Time." *Citigroup Smith Barney Equity research: United States, Leisure Products*. 22 December 2004. Investext Plus. (10 January 2005).
- Pascarella, Perry. "Can't win? Chang the game." *Across the Board*, Sep96, Vol 33 Issue 8, p59. Business Source Premier. (27 March 2005).
- Patcher, Michael, and Edward Woo. "The Definition of Insanity: Why The Next Console Cycle Will Start Off With A Whimper: An In-Depth Look at Interactive Entertainment Software." *Wedbush Morgan Securities Equity Research; Consumer Products & Services: Entertainment Software Publishing and Retail Industry Report*. Los Angeles, June 2004. (9 February 2005).
- Poole, Steven L. *Trigger Happy: Videogames and the Entertainment Revolution*. New York: Arcade, 2000.
- Reid, R. Glen, and Joseph Holland. "Interactive Entertainment: Games Grow Up: A Guide for Investors." *Bear Sterns Equity Research*, February 2005. Investext Plus. (25 February 2005).
- Sheff, David. *Game Over: How Nintendo Zapped an American Industry, Captured your dollars, and Enslaved your Children*. New York: Random House, 1993.
- Tsang, Simon. "Let the Games Begin," *Icon; TheAge.com*. 13 September 2003. <<http://www.theage.com.au/articles/2003/09/12/1063341761629.html?from=storyrhs&onclick=true>>
- "Video Game Console." *Wikipedia, The free encyclopedia*. <[http://en.wikipedia.org/wiki/Video\\_game\\_console](http://en.wikipedia.org/wiki/Video_game_console) (23 January 2005).
- Wahl, Andrew. "My Pick: EA, by about a billion." *Canadian Business*; 1/31/2005, Vol. 78 Issue 3, p17. Business Source Premier. (3 March 2005).
- Wallace, Michael P., Stephanie A. Tam, and Benjamin A. Schachter. "Interactive Entertainment Software (PC and Video Games)." *UBS Warburg Global Equity Research: United States, Technology, Software*. 4 May 2001. Investext Plus (29 December 2005).
- Wingfield, Nick, and Robert A. Guth. "Console Makers Woo Creators of Videogames," *The Wall Street Journal* (Eastern edition). New York: 7 March 2005. pg B1.
- Wolf, Mark J.P. *The Medium of the Video Game*. Austin: University of Texas Press, 2002.
- Wong, Wong. "Hollywood Interest in Video Games Grows." *xPosed, AP Technology*; May 2004; May 16, 2004, San Jose, CA. <[http://m3.typepad.com/hla/2004/05/hollywood\\_inter.html](http://m3.typepad.com/hla/2004/05/hollywood_inter.html)>