Ph.D. Thesis[1]

Is the Game Worth the Candle?
Knowledge Access Requirements in Environments Dominated by Lead Users

Sharon A. Richardson
Ph.D. Candidate
Faculty of Management
The Sir John Cass School of Business
106 Bunhill Row
London, EC1Y 8TZ.   United Kingdom

+1(650)307-7349
sharon@mac.com

November 3, 2006

DECLARATION

FOREWORD AND ACKNOWLEDGEMENTS

TABLE OF CONTENTS

DECLARATION

Is the Game Worth the Candle? Knowledge Access Requirements in Environments Dominated by Lead Users

ABSTRACT

Using the context of the under-researched games software industry, I make the case for lead users as an important source of external knowledge, whose interests contain important guideposts for producer performance. This thesis develops our theoretical understanding of the factors that cause lead users to be interested in individual products, which I argue significantly involve identity considerations that directly concern the product and indirectly concern the creator(s) of products; and also enriches our appreciation of the pitfalls of producers ascribing importance to lead users, which has been an under-researched area of academic inquiry. I balance my study by empirically examining opposing views to ascribing importance to lead users and make the case that the exploration-exploitation construct (March, 1991) allows us to sensibly make the distinction along the lines of a firm's innovation strategy, as to which to adopt. At the basis of my empirical work is extensive data collection from the games software industry, resulting in an original dataset and information pertaining to 120 games, 6 years of data (1998-2003), an extensive social network analysis of greater than 4500 nodes, personal interviews with managers who represent over 40 firms, and notes from product development team members pertaining to the development of 83 games. Three case studies of unusual games are also examined to add richer insights into these questions. The conclusions draw important messages for both executives in industry and academic researchers.

Is the Game Worth the Candle?[2] Knowledge Access Requirements in Environments Dominated by Lead Users

CHAPTER I: INTRODUCTION

In his meetings with students, my advisor would occasionally shut his eyes, place his palms together, and ask for the *story* in order to get to the crux of the matter. These times left me reminiscent of my life in Silicon Valley and the *elevator speech* we prepared and polished in the event we found ourselves in the presence of a potential benefactor for the average length of time it takes an elevator to reach its destination. I have always been of the opinion that one cannot possibly deliver an elevator speech without intimate, coherent knowledge of the thing about which one is speaking. Based on my academic work to this point, however, I have found that sort of insight arrives shortly after I have penned the last line of, at the very least, a reasonably well-written draft.

In spite of this, from the very beginning of my doctoral studies, I somehow remained convinced that an increasing number of knowledge-based relationships and partnerships were occurring in the fast-paced world of high-technology from where I had come, whose goals had little to do with knowledge transfer. There, project or venture partners who could very well be entire firms, were usually experts in a domain and tended to participate in iterative working relationships with one another over time. In other words, for needed expertise outside their domain, contributors were content to rely upon, or *access* the knowledge of others, even those external to the firm, with little to no motivation in transferring the knowledge of these partners to themselves. I became fascinated by studying how this phenomenon, that Grant and Baden-Fuller

---

[2] Refers to the economic tradeoff between the high cost of burning a candle and the value of the game one intended to play by its light. Popularized in The Sign of the Four, part of the Sherlock Holmes series by A. Conan Doyle (1890).

(2004) refer to as *knowledge access*, works, but most of the literature I came across seemed to lean heavily towards knowledge transfer instead.

Despite being forewarned of the changes I should expect, I have nevertheless been humbled and stunned by the extent of transformation that has occurred with almost everything else: My ideas, my approach, and even the context of my research are radically different from the document that transferred me to Ph.D. candidacy, and my thesis a much changed piece of work even since my *viva voce*.

I embarked on a journey that weaved its way through mergers and acquisitions that had evolved from my personal experience and prior academic study in the area, and landed me squarely in the world of software development. In an effort to gain greater clarity on how knowledge advances through the developer structures and support models in place at Apple Computer and Microsoft, I began creating taxonomies to aid my understanding and had an epiphany of sorts while musing over a non-descript graphic I had created. In a way, I had stumbled upon the notion of the games software industry as not just an element in a larger knowledge access story, but worthy of a story unto itself.

I began from the simple premise that games are manifestations of knowledge, and so producers access skills and routines (i.e. knowledge) to create a game (i.e. the manifestation of knowledge). Because the boundaries of the firm are often nebulous in games software development, it became obvious that to make sense of the environment, my investigation of the contributors of knowledge had to dip below the level of the firm, to the level of the individual contributor. I reasoned that if I could understand what was occurring at this level, grouping contributors into firms or quasi organizations would be an easier task than vice versa. What I discovered was that in this industry, in addition to the obvious need for access to the knowledge of producers possessing varying skill sets, significant contributions to innovation were being

made by the industry's lead users (von Hippel, 1986; 1988; 2005) known as *hardcore gamers*. Here, producers tended to hold the belief that a key ingredient to success is access to the knowledge of these users, but the kind of insights they were looking for differed considerably from those derived through the usual customer research mechanisms.

The relationships that deliver games to market are complex and intriguing, and the software end of the industry is under-researched, so my search for explanations from extant theory led me outside the world of business. Well beyond the completion of my coursework requirements, at substantial personal investment of both time and money, I began learning about social network analysis and qualitative techniques in an effort to better understand how to analyze the relationships between individual actors and the routines between them in a networked industry. About the same time, in true snowball fashion, a series of fortuitous endorsements from and highly simulating meetings with Peter Tamte, founder of Bungie and Destineer; Todd Hollenshead, CEO of id Software; Jason Della Rocca, President of IGDA; Bing Gordon, Chief Creative Officer at Electronic Arts; Mary Bihr at LucasArts; Jennifer Olsen, then editor of Game Developer magazine at CMP Media; Marty O'Donnell at Microsoft; and Keith Boesky, past president of Eidos who is now with ICM Talent, opened critical doors to the practitioner world, enabling interviews and valuable data collection from ultimately over 40 firms in the interactive entertainment industry.

Rigorous data collection and analysis is a rarity in games software, so it became evident early in the process that data collection would be arduous, but if I was lucky and worked very hard, the resultant product may nevertheless be capable of at least modest intellectual property. After using John Padgett's Florentine families in what seemed like a hundred different social network analyses, I had grown to appreciate the value of a highly influential original data set, capable of launching and sustaining an academic career. To date, I have amassed information

on 120 games, 6 years of data, greater than 4500 nodes, personal interviews with managers who represent over 40 firms, and notes from product development team members pertaining to the development of 83 games. If anything, paring down my thesis became an extremely difficult exercise, and I had to make deliberate and difficult choices to postpone and occasionally ignore aspects of my study.

As I will discuss in greater detail later on in this work, extant literature argues that lead users are a source of innovation, and they are also key players in the diffusion of innovation. They provide a critical link to the commercial viability of innovation and value creation, being a sort of gauge for what will be future needs in the marketplace. Although knowledge stickiness tends to be a problem because they possess unique knowledge, lead users are nevertheless recognized as an important source for external knowledge and a proven link to future performance. Aligning and partnering with these users is acknowledged as being of great benefit to producers, and therefore is of consequence to strategic management.

Here, I first make the case that if we can ascertain why some products in particular continue to be of interest to lead users, this information can then be important guideposts to performance for producers, especially in industries dominated by these users. For my own work in this thesis, this translated into asking *what are the factors that cause lead users to be interested in individual products (games)?* In games software, an important precondition for lead users' involvement and accessibility seems to be their inherent interest in products or in particular creators of products, which I argue has much to do with identity considerations.

Secondly, existing research centers on the benefits of producers partnering with lead users, but we are given few hints as to potential pitfalls of that partnership. I examine this relatively under-researched area to understand whether there are circumstances when producers should be vigilant about evaluating the usefulness of lead users opinions rather than simply

ascribing them importance. For my second research question, I ask *what are the pitfalls of producers ascribing importance to lead users?*

The academic study presented here demonstrates that little is known about both the drivers of lead users' interest, and the limitations of lead user importance. For this work, I use statistical methods in which I include variables derived from an extensive social network analysis. In addition, I use microanalysis to help readers understand the nuances of this exciting industry, and qualitatively examine 3 different games and the relationship each case has had with the lead user community. Finally, acknowledging the empirical limitations of my work, including those inherent to games software, and also the opportunities that exist for future academic work, I argue for further research.

The first part of my title hints at the industry I have chosen to research. It traces back to my long-standing fascination with Sherlock Holmes and although A. Conan Doyle popularized the term "the game's worth the candle", its original application stemmed from the economic tradeoff between the enjoyment derived from playing a particular game after dark and the need to consume what was considered a very expensive resource at the time: a candle. Asking the question in the context of actual game-products in the games software industry, which faces escalating costs of game development, diminishing innovation, and break-even points that are getting harder and harder to attain, seemed fitting. The second part of my title addresses my objective of studying an industry dominated by lead users and unpicking the relationships that exist within its social fabric to discover how producers can access vital, external knowledge.

I argue that environments inherently dominated by lead users pose special considerations for the firm, and Chapter II provides details on the unique context of games software. In particular, I discuss the industry as a hybrid, network environment and examine some of the

issues it faces. In this chapter I also examine the critical relationship between games software and hardware.

I devote Chapter III to an in-depth discussion of the hardcore gamer as the lead user of the games software industry, considering this user's role as a consumer first, and then as a creator of value. In this chapter I review academic theory that helps understand this user as well as discuss the reasoning behind my synonymous treatment of the hardcore gamer and the lead user. I begin theory development relating to the hardcore gamer identity in this chapter, so it is an important feeder into Chapter IV, which is the main chapter devoted to laying the theoretical foundation for the thesis and developing the hypotheses.

Chapter V presents the methodology and Chapter VI sketches the findings of my statistical work. Traditional statistical techniques support this study, along with variables derived from an intensive 4600-node social network of game creators affiliated with high performing games over a 6-year period. Readers should note that I defer discussion to Chapter VIII, later in this thesis.

Chapter VII is a compilation and analysis of 3 separate cases of games that have launched product families and have experienced varying appeal to both lead users and commercial performance, although all of them have been successful in their own right.

In Chapter VIII, I present my discussion on the drivers of lead user interest, the limitations of ascribing importance to lead users, and the unique insights and richness that can be derived from social network analysis tools and theory.

Lastly, Chapter IX closes the thesis with a discussion of limitations, future research opportunities arising from this work and personal musings on games software that have arisen from my learning.

Chapter II   THE BUSINESS CONTEXT OF GAMES SOFTWARE

The world of interactive entertainment has had a short, turbulent history and a growth trajectory that has defied economic trends affecting the rest of the high-technology industry. This industry, also known as the computer and video games industry, or simply *games* industry, has a strong likelihood of emerging as the most lucrative form of entertainment in the future with usage levels second only to the Internet (Lewis, 2003b), and unquestionably provides fertile ground for academic research. While there has been a fair amount of academic work (Brandenberger and Nalebuff, 1996; Coughlan 2001a, 2001b, 2001c; Brandenberger, 2002; Gallagher & Park, 2002; Bonardi and Durand, 2003; Schilling, 2003; Shankar and Bayus, 2003) on the hardware end of the industry, games software has been largely under-researched, so this chapter lays the groundwork for the thesis by introducing readers to the nuances of this fascinating industry. Data for this chapter has been compiled from a wealth of secondary resources, including industry reports from trusted sources, and is also backed by extensive primary data collection, that includes in-depth personal interviews, with assistance from industry insiders representing over 40 different firms.

As this chapter and the next will show, there are aspects of games software that make it unique, challenging, and intriguing to study, and to that end, a synopsis of relevant conclusions is below:

o   Games software is a hybrid environment of entertainment and high technology in which *whom you know*, speed to market, technological change, and artistic performance are all important considerations.

o   A critical issue for firms stems from long product development cycles that span approximately 24 months in duration, and short opportunities for retail relevance, at 45-90 days on average.

o A complex network of skills and routines operating in a project-based, rather than firm-based, environment delivers games to market.

o Because average game development costs have escalated some 500 times in 20 years, having a top selling title that sells more than 1 million units is one of the few assurances of cost recovery and potentially, profitability.

o The volume of titles released in the market each year is much greater than the market can bear.

o The majority of top-selling games are *franchised properties*. That is, they are sequels or based on licenses rather than original content.

o Historically, games software has shared an interdependent relationship with the market for hardware that can be partly understood within the context of technological cycles.

o Largely due to industry maturation, backward compatibility of hardware, and the emergence of platform-agnostic development models, software's dependence on hardware for growth and survival has recently become less critical.

o Games software has been a *prosumer* environment focused on lead users known as *hardcore gamers*, but there is growing appreciation in the industry for the mass market opportunity that the *casual gamer* represents.

o Although their representation as a percentage of the total has decreased, *hardcore gamers* continue to dominate the games software industry in terms of influence and mindshare with producers and other gamers, so access to these users is still considered vital to business strategy.

2.1 A Hybrid Environment

Scholars have documented performance heterogeneity at the level of individual, organization, and environment, and a wealth of empirical work already exists, arguing for the inclusion of context. However, because descriptors for emerging environments are oftentimes elusive, it is not unusual for us to use analogical reasoning (Gavetti, Levinthal & Rivkin, 2005) and at least for a time, to treat a new environment as a "blend of different known environments",

which I term a *hybrid* environment here, so we can understand its novelty in the context of known terminology. For example, the uniqueness of high-technology has lent new and often complex direction to the field of strategic management, as we grappled with what it meant to be in constant flux and for a firm to be associated with such descriptors as high-velocity (Eisenhardt, 1989), flexible (Bahrami & Evans, 1989; 2005), and modular (Sanchez & Mahoney, 1996), all at once. In this same spirit, I present the unique context of games software as a hybrid, network environment that shares a mutual dependency with the hardware side of its business, and as the next chapter will show, is influenced greatly by its lead users.

Games software is a hybrid environment in the sense that learning from studies on cultural industries such as motion pictures, on fast-track environments such as high technology, and on networks, can readily be applied. To begin to understand the game software industry, we must see it as a blend of entertainment, high-risk, high-technology, and high-uncertainty, largely utilizing the network form of organization. There can be no denying that computer and video games are a part of the entertainment world, delivering experiential, cultural products. Much of the work of Lampel, Lant, & Shamsie (2000) on cultural industries, specifically filmmaking, can be quite readily applied to games. In particular, 1) the "highly visible" nature of the industry and its impact on values, attitudes, and lifestyles;   2) the "combination of ambiguity and dynamicism" that is an intrinsic part of the environment for non-utilitarian goods; and 3) the reconciliation between artistic expression and "the economics of mass entertainment". Game development and production cost and complexity today rival that of major motion pictures, and as a result of the crossover in employment, locating close to Hollywood has become important for companies like Activision, THQ, and even publishing giant, Electronic Arts (Hall & Ketaki, 2003). Grossman (2003) observes, what had begun as single-person game development projects, contained on about 50 typewritten pages of data or 100 kilobytes, had culminated, by the year

2000, into an almost unbelievable set of statistics: *An average game produced by a major game publisher cost $5-10 million to develop, required 1-3 years in development time, and a team of 10-50 developers and artists producing 500 megabytes of data, comparable to a 10-volume encyclopedia set.*

Understanding the draw of interactive entertainment from experience with game brands like Tomb Raider, Super Mario Brothers, Final Fantasy, and Pokémon, and witnessing its own box office take fall short of game industry revenue[3], the motion picture industry continues to search for potential partnerships in the industry. Evidence of growing interest and parallels between the two industries can be found in abundance today. Keith Boesky, ex-President of Eidos, now operates out of an office in Beverly Hills at ICM Talent, matching motion picture talent with that of the games industry; G4 TV is specifically contracted by Warner Bros. to search for games that can be parlayed into film; The new Matrix films have nuances that only a gamer can understand; and industry insiders often use analogies from the motion picture industry to describe and understand events occurring in the games software industry.

The video industry has been on the threshold of seizing dominance in entertainment for several years. Ultimately, it will...There is a fundamental difference between movies and video games: The games are interactive, movies are passive.

                       - Bob Schwabach, The New York Times, May 13, 2001

The key to the dominance columnist Schwabach refers to, many would argue, is fun. When Americans were asked which entertainment activity was most fun, video games (34 percent) soared at over double many of the others that may come to mind, such as television-

---

[3] Total video game sales in 2003 was $10 billion, compared to $9.3 billion for movie box office revenue, according to market research firms Exhibitor Relations and NPD Group. The interactive entertainment industry had fared comparatively better in revenue for the year 2002 as well.

watching (second, at 13 percent), going to the movies, or even surfing the Internet.[4] This element of fun has allowed video games to permeate and converge with other aspects of popular culture such as television, toys, motion pictures, sports, and even music. It is fun that has made *gameplay*[5] remain one of the most consistent and important success factors in games software.

One of the most striking differences when making a comparison to motion pictures is that in the games industry, products do not launch long equity streams. In fact, for most games that become commercially available, insiders warn that opportunity or retail relevance is limited to 45-90 days at best. Interactive entertainment has been possibly the only form of entertainment with a single distribution window. As a result, titles with *legs*, or relevance-longevity, are extremely worthwhile to study. A second difference is that, in the games industry, the role of critics and vehicles such as awards and recognition outside of the NPD system is still in its infancy, so whether what Lampel and Shamsie (2000) call "relatively autonomous information providing institutions" can assist firms in gaining *sales momentum* is as yet undefined, alongside the identity of these institutions.

Drawing parallels between games software and the motion pictures industry should be made with some caution. Games software has had at least 2 failed marriages with Hollywood: The first ended in 1982 with Atari's 6 million-unit blunder with the release of a game called *ET: The Extra Terrestrial*, under the ownership of Warner, whose stock subsequently fell 33 percent in a single day of trading; The second failure was from a strategy that lasted about 5 years, from 1995-2000, and involved the set up and subsequent failure of *interactive divisions* at various Hollywood studios.

---

[4] Remarks of Douglas Lowenstein, President, Interactive Digital Software Association at the Electronic Entertainment Exposition, May 17, 2001.

[5] Meaningful interaction of a user with a gaming object during which the user follows a set of rules and attempts to play the game at a progressively higher level. Because games are about whole experiences, hardware and software interact to create unique, less limiting, and more memorable experiences for users around the basic or core element known as gameplay. (adapted from http://zappa.tvu.ac.uk/00RAMT/gameplay1.html)

The third and present endeavor is mostly game publisher-led, and focuses on licensing Hollywood properties to leverage popular concepts and brands from elsewhere in the entertainment world, and also on utilizing crossover talent from film. The reuse of talent is becoming more of a necessity, as users demand greater realism in games, which requires graphics and imagery to approach that of the motion picture world. The music industry has also begun licensing properties to games, and there is a fair amount of collaborative activity on exclusive offerings.

The high technological focus of games software brings the industry more in line with the frenzied change model of Bahrami and Evans (2005). In environments marked by speed and hypercompetition (D'Aveni, 1994), such as high-technology, firms generally face short windows of opportunity or relevance longevity, and this is certainly true of games. Due to resource limitations, human capital included, firms operating in environments facing rapid technological change must make difficult decisions to develop, manage, and abandon projects. Aside from its entertainment focus, a marked difference between games software and this second environment of high-technology, is that game development is an extremely complex, risky, and artistic activity, which is unable to sustain rapid product entry and frequent product innovation. A game development project, on average, is about 24 months long, and often, most of the smaller development houses can only sustain a single project at a time, usually risking the firm on it. Keeping a game relevant to the market as the underlying technology and user expectations change rapidly is an enormous undertaking.

2.2 A Network Environment

In the networked environment of the games software industry, relationships and connections between actors are recognized as critical, so the application of social network theories and methods are especially pertinent. From its garage and Silicon Valley beginnings to the recency of its birth; the extent, consequences, and speed of its technological change; the reality of its foundation as a source of entertainment; and the involvement and knowledge of its community of stakeholders who ascribe importance to celebrity, it is easy to understand why *whom you know* remains very important.

An intricate network of knowledge[6] generates ideas for games, develops them, and advances them to commercial fruition. Many variations and combinations of the roles, the relationships between them, and skills outlined in Exhibit II-a exist in a project development environment, and this lack of standardization can lend a great deal of complexity to any study of knowledge. Furthermore, the entities contributing these skills may be individuals or firms, either contractually or less formally held together by agreements between the partners.

Game creation or development is generally separated from publishing activities. This function alone can be completed by a handful of individuals who are loosely grouped together; who are entirely represented by a firm with a formal organization; or are a combination of the two. Unless the developer is already part of a larger organization that also has a publishing division, its management generally relies on a partnership with a publisher to take the titles to market. Again, a wide variety of arrangements exist, in a similar manner to venture capital financing, but on average, a developer's business model is based on milestone payments or

---

[6] Since this thesis focuses on games software and a large body of high quality academic work already supports interest readers may have in this area, I rely upon this work for my discussion of the relationship between software and hardware, and only a brief introduction to the hardware side of the industry is contained in Appendix II , in addition to the discussion in this chapter. The decription of major industry roles is contained in Appendix I.

advances to cover costs and royalties negotiated with publishers, usually bringing in anywhere from 5-20 percent of the wholesale price. As a result of publishers' responsibility for financing, project and budget management, marketing, and distribution, this side of the business is thought to present the greatest risk. Publishers in games software often distribute the games they publish, especially if they are medium to large sized firms. A few examples of distributors typically available to smaller firms seeking support include Alliance Entertainment, SVG Distribution, MDS Distributors, Regal Games, and Pioneer Distributors. These firms create the link to retailers for those publishers and developers that do not already have access to retail channels.

Exhibit II-a: Major Roles and Relationships of Games Software
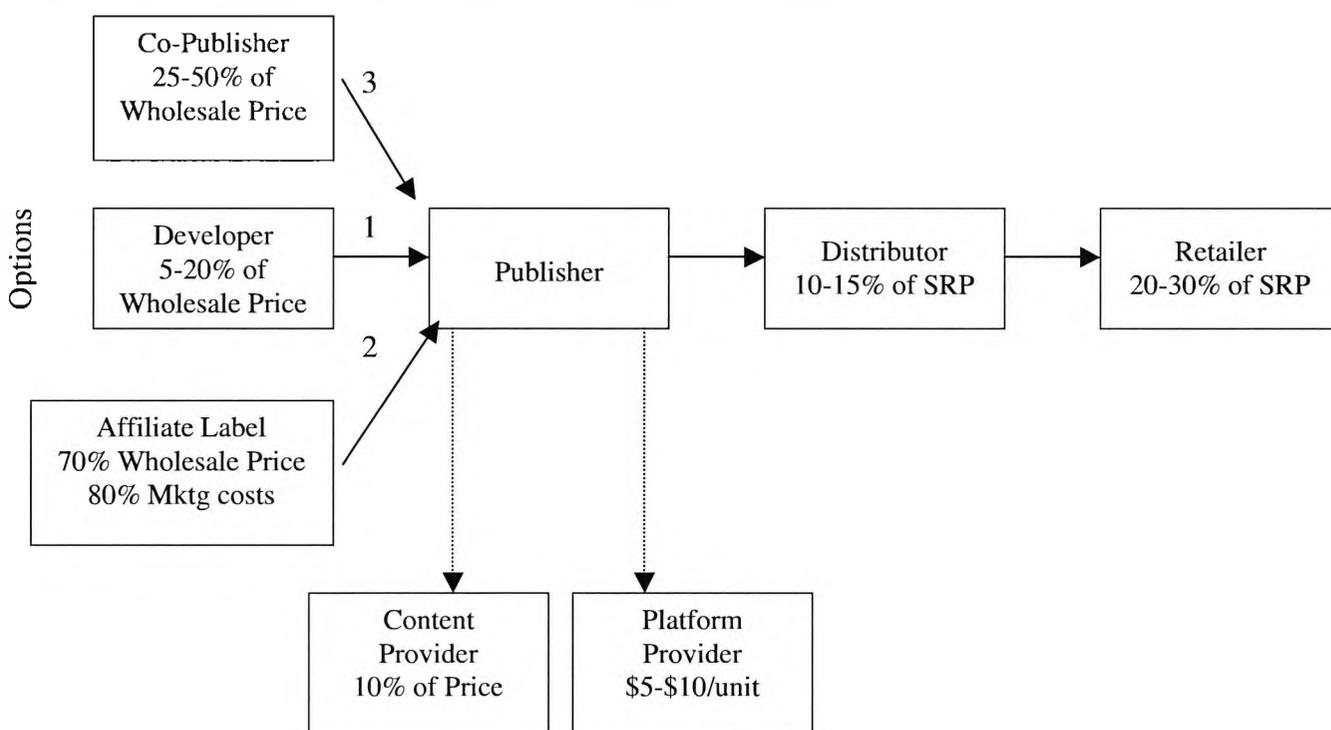
Sources: IDG Entertainment, DFC Intelligence

Affiliate labels allow developers to take on greater responsibility for roles traditionally contained in the publishing function, typically having to do with marketing. They spread risk to developers and are options that allow them to earn up to 70 percent of wholesale price, but these models are not as popular as they are in the music industry. Finally, co-publishing models in

which developers might fund all costs of development and assume more of the financial and project management risks traditionally assumed by publishers reportedly allow them to extract 25-50 percent of the wholesale price.

Distributors in games software generally earn 10-15 percent of the game's Suggested Retail Price (SRP) and retailers tend to make anywhere from 20-30 percent of the same. For planning purposes, SRP is usually about $50 for console games, $40 for PC games, and $60 for portable games. Platform manufacturers' royalties extend from $5 to $10 per unit sold and content providers, such as license owners can extract an additional 10 percent of sales price.

Skills are routinely accessed as needed from outside the firm, but in games software it is not justified to think of these collaborative relationships purely as an outsourcing: Not only are the interactions between partners highly complex, but partners' knowledge is often accessed repetitively over time when the relationship is deemed to be successful, as Bungie did with its audio needs prior to its acquisition by Microsoft, at which point Marty O'Donnell and Michael Salvatori who were providing these services, were hired as employees. Given these iterative, non-modular working relationships and the non-standard collaborative arrangements that exist in this environment, it may be justified to treat these project-based partnerships as skills combined into groups that are essentially a sort of *quasi* organization.

To more tangibly understand the relationships in games software, Exhibit II-b illustrates revenue share of different entities in console games software, under 6 different scenarios: 1) A traditional publishing arrangement in which a developer is hired by a publisher and is paid a royalty. Here, the publisher is also the distributor and content is Original (O) 2) An arrangement just like the first model, except that content is Licensed (L). 3) An affiliated label model in which the publisher plays the role of developer as well and the distributor also publishes. Content is original. 4) An arrangement just like the third model, except content is

licensed. 5) A developer-publisher model in which a national distributor is employed. Content is original. 6) An arrangement just like the fifth model, except content is licensed.

Exhibit II-b: Revenue Share in Console Games

	Publisher: Original Content (O)	Publisher: Licensed Content (L)	Affiliate Label (O)	Affiliate Label (L)	Dev-Pub (O)	Dev-Pub(L)
Retailer	20%	20%	20%	20%	20%	20%
Distributor			20%	17%	10%	10%
Publisher	58%	49%	46%	39%	56%	46%
Developer	8%	7%				
Platform Provider	14%	14%	14%	14%	14%	14%
Content Provider		10%		10%		10%

Source: DFC Intelligence

2.3 Escalating Costs

An everyday reality in games development is what Lampel, Lant, & Shamsie (2000) refer to as the reconciliation between artistic expression and "the economics of mass entertainment" and much of the economics have to do with escalating costs. A well-used statistic by firms in the games software business is that to recoup costs and draw rents, a game needs to sell at least a million units, but alarmingly, it was not until 2004 that The NPD Group reported that for the very first time, a record-breaking 12 games sold over a million annual units (Ipsos-Insight for the ESA, 2005). For the period under study, this milestone generally equates to Top-10 sales ranking by market research firm NPD, that issues the annual rankings for the industry. Whether a game is able to achieve this level of sales is a combination of many different elements beyond simply differentiation, among which is the structure of relationships in the network, sound business strategy, the platform or hardware attachment decisions made by the development team, and the team's ability to manage their funding needs against escalating costs for developing and commercially deploying a game.

With the advent of 3D technology and RISC processors in the late 1990s; and the switch to CD/DVD storage technology which enables higher quality audio, video, and animations, games have grown more realistic and also significantly more expensive to develop. More expertise and specialization has grown the size of project teams, putting further upward pressure on costs.

Although platform manufacturers orchestrate a fine balance by licensing third-party developers and controlling the quality of games in the market, for the past few years the volume of titles in the market has been greater than the market can bear. In what is becoming an increasingly mass market, platforms are maturing and "the 80 percent market share of top titles is becoming 90-10 instead of 80-20" says Richard Wnuk, President of Jaleco Entertainment. "There is either an A title or a D title". Nevertheless, the number of SKUs released per year for consoles has been well over 600; about 400 for PC games; and approximately 200 per year in the market for portables. The NPD group estimated that about only 190 of these in the year 2000 sold 200,000 units or more, yet from 2001 to 2002, the number of titles grew 50 percent (Pham, 2003).

As a result of soaring costs, at the very minimum, insiders commonly apply the heuristic of at least 500,000 units to break-even and 1 million units to claim a hit. DFC Intelligence (2004) claims only 5 percent of SKUs will reach this level. Brian Farrell, CEO at THQ reminisces about the 8-bit era, and is less optimistic than DFC Intelligence: "You spent $200,000 to make a million dollars", contrasted to today's "$6, $8, $10 million. You may even pay them a $4 to $5 royalty. You sell a million just to earn back your costs." Similarly, Mike McGarvey at Eidos claims, "To make any profitability at all, we've got to get to 750,000 and really a million to get that 12 to 15 percent contribution." In short, the commercial success of a game revolves largely around volume, and specifically whether the game has achieved *top-10* annual

sales status. Insiders warn that development may move to lower cost areas overseas if the model cannot be changed and new entrant survival is not viable. Since the nature of the business model, especially the need for critical mass, marketing muscle, and deep pockets have become so important to the current games software business model, consolidation has risen, alongside costs and in Appendix III, we can see evidence of this activity.

To differentiate titles, a variety of pre-selling strategies, expensive marketing campaigns, online user communities, licensed content, and sequels are heavily utilized in order to become part of the user's consideration set at the point of sale, and the retailer's consideration set for shelf space. Today, development costs alone can average $5 - $10 million for an 'AAA' title, with marketing costs estimated at about the same amount. Furthermore, development cycles in this industry are long, at about 24 months, while games stay relevant at retail for only a short time; anywhere from 45-90 days on average.

It is easy to see why releasing cross-platform, multi-lingual titles with global reach, and titles that are capable of sustaining product families have become necessary strategies. Although supporting additional platforms can extend timelines by about 6 months and costs by about 30 percent, the case to be platform-agnostic is a strong one.

Because licensed content can extract an additional 5-25 percent of wholesale revenue, with potential advances against royalties as part of the content provider's agreement, many insiders claim that one of the most profitable strategies for a developer is to own a license or a franchise. Ed Fries, who used to be in charge of content at Microsoft says, "I think the basic business model is broken. The only way you can justify the budget is to not only see if the first game is going to succeed, but also that you can build franchises for the return. That's kind of scary."

Today, software behemoth Electronic Arts makes 1 of 5 games sold in the United States and a little less than three-fourths of its revenue comes from brand franchises or licenses, so some further discussion on the importance of the brand franchise in games software is surely worthwhile.

2.4 The Importance of the Brand Franchise

Since games software is a relatively low-margin business[7], the commercial success of a game revolves largely around volume, and specifically whether the game has achieved *top-10* annual sales status, which as discussed, generally equates to 1 million or more units sold. As I have also noted, the window of retail relevance in this industry is extremely short, at an average of 45-90 days, yet product development cycles are traditionally long in duration, at 24 months on average. To counter the market realities, which includes escalating costs, short retail relevance, oversupply of games and long development times; and facilitate revenue growth for the firm, games software firms use a variety of strategies, which include:

1) Creating a top-selling, blockbuster title that may have relevance longevity in and of itself (e.g. due to the quality of the game, innovativeness, etc.);

2) Pre-selling the game to audiences, in order to maximize the sales potential of its time spent on the retail shelves, via marketing campaigns whose cost rivals even the high cost of game development;

3) Using and re-using knowledge resources available to the firm that are perceived to be well-positioned to extract value;

4) Managing user communities and providing a variety of tools to maximize the effects of positive word-of-mouth, sales, and repeat business;

---

[7] Cost of Goods Sold can be anywhere from 30 to almost 50 percent of Gross Profit, and fixed, marketing and licensing fees are substantial, driving up Operating Costs. The industry profit model published by Gerard Klauer Mattison in IDG Entertainment's 2003 Industry White paper assumes operating profit contributions of games at the AAA or 1 million unit level are at about 37 percent of Net Revenue.

5) Utilizing product extension or product family strategies involving what have become known as game franchises.

It is to the last point that I draw attention in this section, because the product family is an important exploitative model in the games software industry. Franchises, sequels, versions, and models, are a few cross-industry terms that have been used to represent an underlying exploitative type of business model or a product family. The use of the term *sequel* in the strategy literature has been generally used in the context of the motion picture industry, and perceived by users as a continuation of a pre-existing social concept or cognitive category, be it a license, narrative, or some element of popular culture (Simonet, 1987) such as a literary, dramatic or cinematic work. Prior empirical studies (Hennig-Thurau, Walsh & Wruck, 2001; Stepanek, 2004) have examined the influence of sequels in a film's box office draw, for their ability to predispose consumers to "positive associations" and reduce uncertainty regarding quality, therefore increasing the probability of attendance. As a general rule, successful franchises in the games industry draw licenses from books, toys, television and film (Powell, 2002). Licensed properties, which Ted Price at Insomniac claims indicate the success of crossover between games and mainstream media represent over 70 percent of the top selling titles today. They may have the advantages of 1) Familiarity and uniqueness, 2) Built-in demand, 3) Added entertainment value, 4) Face validity, and 5) Marketing assistance and synergy (DFC Intelligence, 2004).

Many in the industry claim that owning a popular license is one of the greatest assets a games software firm can have. Ed Fries of Microsoft commented on EA's line-up of licenses as "about as bullet-proof as you can get in this business." These licenses no doubt contributed to the billion-dollar quarter Electronic Arts had in 2002, and the halo effects across their product offerings, especially in the sports category. In as early as 1999, over 30 percent of Nintendo's

revenues resulted from the Pokèmon franchise (Huebner & Olsen, 1999). The Madden NFL Football franchise has now sold more than 43 million copies since its launch in 1989, and it continues to be the #1 football franchise and the all-time best selling sports franchise in North America[8]. As noted earlier, Electronic Arts makes one in every 5 games sold in the United States and a little less than three-fourths of its revenue comes from repeat hits.

Since a franchise is one of the strongest claims to intellectual property that a games developer or publisher can make, it also tends to figure prominently in any discussion of firm valuation. For Westwood Studios' intellectual property, which mostly meant the strategy franchise *Command and Conquer*, that had reportedly sold over 21 million units on multiple platforms, Electronic Arts paid Virgin Interactive $122.6 million in 1998; Shiny was worth $47 million to Atari for its licensing of *The Matrix*; and Ensemble obtained a "highly-lucrative, undisclosed offer" from Microsoft for its *Age of Empires* franchise (Rogers, 2004a, 2004b, 2005).

The importance of franchises to firms' commercial performance and even survival is highlighted repeatedly during industry events and research. During the popular trade show E3 in 2005, at a developer panel session on video games licensing and ancillary rights, participants noted that due to the *narrow window* for returns in interactive entertainment compared to motion pictures, there was a need for a powerful financial model, with at least "three individual products planned" from each game franchise (Diamante, 2005). Designer/developer Bruce Shelly (2001) holds that one of the guidelines in launching a successful game is to demonstrate it can launch a franchise, as it is such a framework for subsequent product development that makes the games more attractive to publishers and consumers. According to Shelley, "The newer a game is (i.e. genre, topic, artistic style, technology, developer, publisher) the more difficult it is to get shelf

---

[8] http://www.gamasutra.com/php-bin/news_index.php?story=5921

space, media coverage, web following, and customer awareness; all of which relate directly to commercial success. Creating a great franchise makes those tasks much easier and makes it possible to increase the customer base for each succeeding product".

2.5   The Relationship with Hardware

It is true that historically, the more powerful firms in interactive entertainment are those that have controlled the most desired hardware. Those firms that have been able to equip their platform with technological advancements valued by consumers at affordable price points, and built a community around their brand have historically been in influential positions in the industry. While technological superiority has not been a necessary factor in consoles' success, the ability to pass on the advantages from declining costs in processing power and memory to users and the availability of a library of quality software, has been essential.   George Harrison, SVP of Marketing at Nintendo claims that the industry's leading console, the Playstation 2 (PS2) has the weaker technical components, which is a point not entirely without merit, as Exhibit AII-b in Appendix II, which compares the 3 most popular current video game consoles, will verify.

Several academic studies of the games industry have examined the hardware market, typically looking at the console industry and the network effects that are a classic feature of it. Some of the most pertinent are listed below:

- Schilling(2003) explores the US console game industry, to create a framework for assessing technology value and to suggest both offensive and defensive strategies that are applicable to network externalities industries. She offers a chronology and assessment of competition across three generations of consoles.

- Shankar and Bayus (2003) empirically demonstrate the asymmetric nature of network effects between competitors in the console video game market. These authors show how

Nintendo, with its smaller customer base has higher network strength than Sega, despite its larger network size. Their resource-based view accounts for the success of Nintendo in the 16-bit video game console industry.

- Gallagher and Park (2002) conduct a historical analysis of the industry from a standards-based perspective, examining the influence of competitive dynamics in a standards-based industry that includes the influence of dominant design (Abernathy and Utterback, 1978; Utterback, 1994) and first-mover advantages.

- Bonardi and Durand (2003), most recently used the industry as a case in their creation of a three-phase framework to assess, and strengthen network effects relating to high-technology products.

- Chronological accounts (Brandenburger and Nalebuff, 1996) and several firm-specific student case studies (Coughlan 2001a, 2001b, 2001c; Brandenburger, 2002) have also been published.

- Finally, Venkatraman and Lee(2004) look at the industry using a more integrated perspective, by studying how game developers' choice to launch games for a particular console is influenced by network structure, and by platform characteristics of newness and dominance. Looking at how video games networks that combine both hardware and software evolve and change over time, these authors conclude that platform dominance and newness do in fact drive preferential linkage between software developers and hardware platforms.

Although hardware manufacturers tout games as only one element in a race to lead interactive services from the homes of consumers and the more recent consoles have hard drives and both DVD and online capabilities, games are the *raison d'être* of interactive entertainment.

The relationship between hardware and software is unquestionably dynamic and one of mutual dependence. In the games ecosystem, the success of each is inextricably tied to the other. Product launches require coordination, although relationships may not be supported by long-term contracts or equity investments (Venkatraman and Lee, 2004; Gawer and Cusumano, 2002).

Few would argue that content is key to a platform's competitive positioning, and that without a strong library of titles , the hardware would have little draw. As one peruses the listing of popular consoles from 1996-2003 in Appendix II, the story of their performance may ultimately come down to being a software-related one. IDG Entertainment goes so far as to say that the First Commandment of the gaming market is, "It's *always* about the games".

Exhibit II-c: Change in Share of Revenue 1996-2004
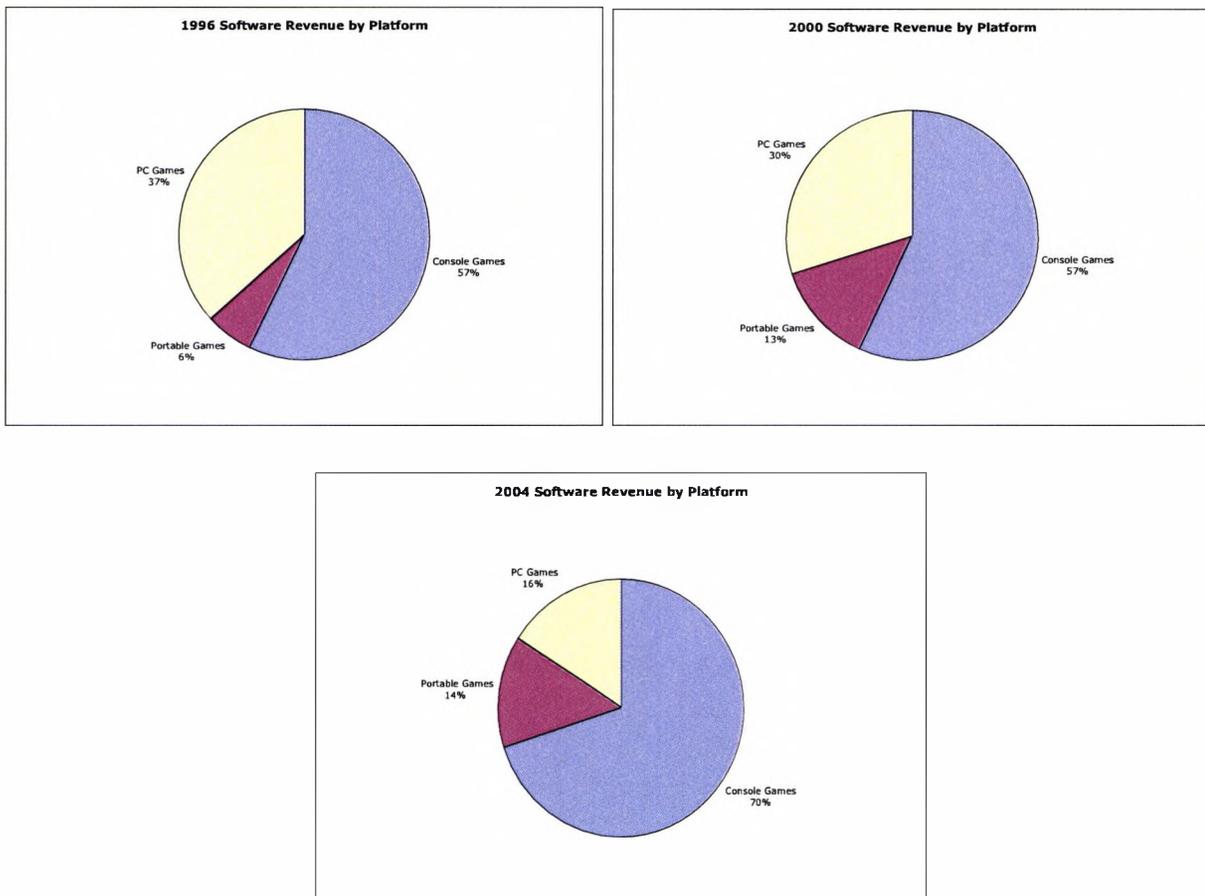
Sources: IDG Entertainment, DFC Intelligence, NPD FunWorld

Understanding the share of hardware is critical. In terms of share, consoles are the largest contributor to industry revenue, followed by the personal computer and lastly, the portables segment, although the mix has changed quite dramatically since 1996, as readers can verify from Exhibit II-c and II-d. From 1996-2004 PC games lost more than half their share of the market. Part of the loss was attributable to the gain of console games, whose share increased by 23 percent. The rest of the loss was due to the portables market that recorded a 130 percent gain for the period. Sony, Microsoft, and Nintendo are currently the 3 major console manufacturers in order of performance for what is known as the 128-bit generation, while Nintendo has dominated the portables segment since 1990 with its Game Boy products.

Exhibit II-d: Annual Software Revenue by Platform
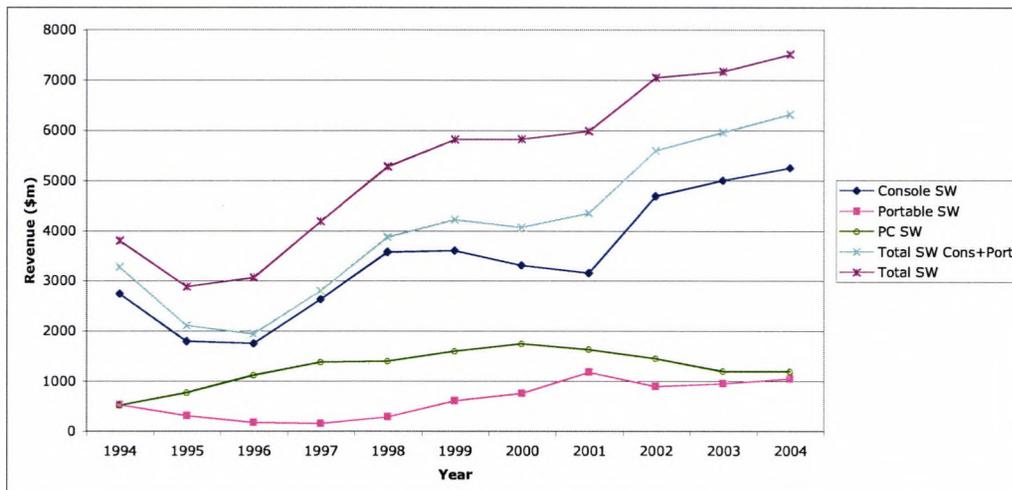
Sources: IDG Entertainment, DFC Intelligence, NPD FunWorld

Consoles sales have been cyclical in roughly 5-year increments, and although portables are also cyclical, their cycles are expected to last much longer. These effects are examined, beginning with Exhibit II-e and II-f that follow:

Exhibit II-e: A Cyclical Industry
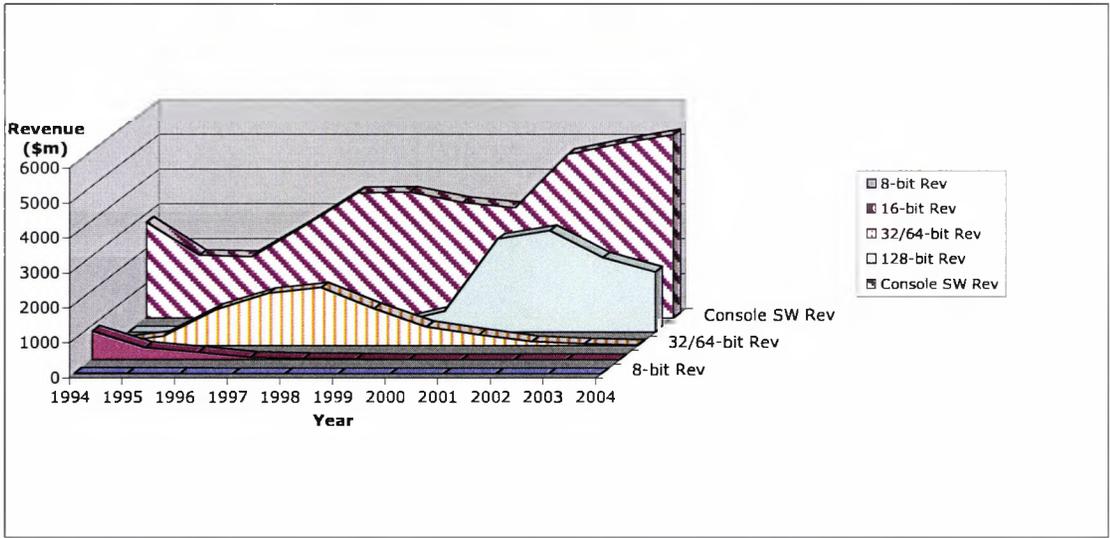
Exhibit II-f: Annual Software Revenue by Platform
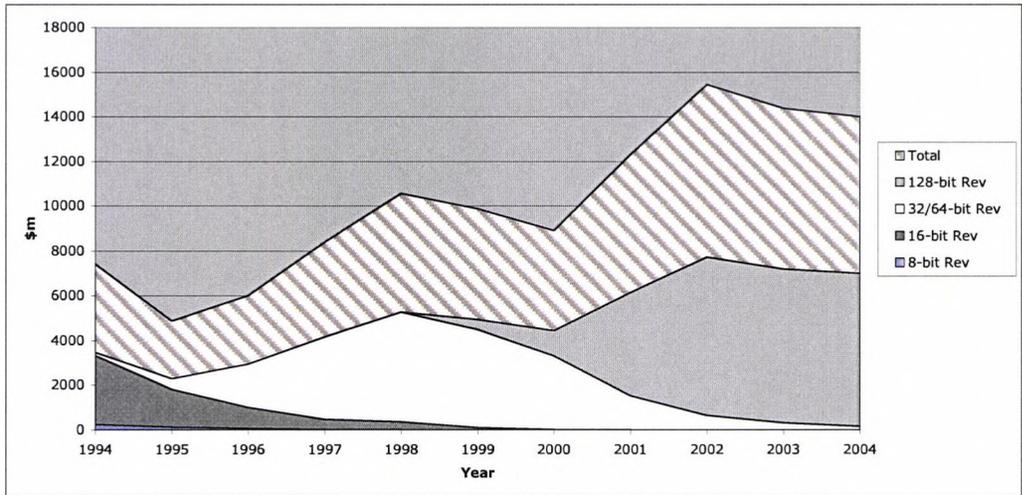
The cyclical nature of the industry has been responsible for keeping the total number of households that own video game systems relatively flat. By the end of the 128-bit cycle, DFC Intelligence estimates that as much as 50 percent of the households owning a 128-bit system will own a second one. They further estimate that in 2003 there were 45 million households with a

video game console, and over 75 percent of those households with children between the ages of 8 and 17 own a video game system.

On average, the software cycle lags that of hardware, and insiders agree that it takes over a year after the launch of a new console that subsequently becomes established as the dominant design, before software development occurs at appropriate quality standards and volume. Network effects, which are characteristics that cause products to have value to customers that is dependent upon the number of customers already using the product, are definitely at play in games software. As Sega discovered with the launch of Dreamcast in 1999 and its subsequent announcement to become a software-only provider in 2001, even if hardware manufacturers are successful in attracting game development, without a significant installed base, software developers and publishers will not be able to break-even; And as 3DO discovered with its technologically superior, $700 console, without an adequate library or at least a platform-defining title in addition to the right pricing strategy, users will not buy the hardware in sufficient quantities to develop an adequate installed base, that in turn promotes game development. A platform-defining title, as the game Halo was for Microsoft's XBox, is a game so much in demand that gamers commit to buying the platform to acquire a game.

As noted earlier, Venkatraman and Lee (2004) have established platform dominance and platform newness as drivers of preferential linkage by software developers. This preference results in an increase in competition, and unless hardware manufacturers have controls in place, this fuels a surge in the number development projects for the most current, popular system, and a surge in the number of titles that become commercially available concurrently.

Hardware manufacturers are quite focused on the quality and related quantity of titles during the earlier stages of the hardware's lifecycle, but this control tends to diminish later in the lifecycle when they begin looking to the next generation and are simultaneously interested in

exploiting the current generation as best they can. Competition amongst developers grows the software to the limit of its demand and policing becomes exceedingly difficult.

Additionally, the choices manufacturers face in making quality control decisions can themselves be extremely hard. For instance, most manufacturers try to dissuade software developers and publishers from porting[9] titles developed for another platform. These titles are meant to showcase platforms they were created for, not the ones they are ported to, so may perform at a sub par level on the new platform. The risk is that users may perceive this poor performance as platform-driven, rather than title-driven. Cross-platform incompatibility can make porting a game to other platforms an extremely trying venture, and porting is extremely difficult to control, especially later in the lifecycle, when users expect all the popular titles will be made available on the platform. With the surge in competition at maturity, new developers become "less likely to launch products in a crowded space in which other developers and titles have strong presences"(Venkatraman and Lee, 2004). There is additional downward pressure as the platform is no longer considered new, so porting becomes an avenue for an additional revenue stream from a proven title, even at the risk of poorly showcasing the platform. Clearly, an important aspect of the relationship between hardware and software to consider is not just how hardware can constrain the market potential of software by installed base considerations but also how the limitations of the platform can constrain the creative potential of a game.

How long a software cycle is sustained largely depends on the speed at which the new installed base grows and the size it reaches as a result of incumbents' strategies, the strategies of new entrants, and the expectations of the success of each that is often based quite heavily on the technological decisions made by platform manufacturers. For example, the groundbreaking

---

[9] According to Wikipedia(2006), "porting is the process of adapting software so that an executable program can be created for a different computing environment (eg, different cpu, operating system, or third party library) to the ones it currently runs on."

decision by Sony to introduce backward compatibility to the industry for the first time enabled software manufacturers to continue development of the original Playstation while issues with Playstation 2 (PS2) were worked out. The result, as Exhibit II-e demonstrates, was a smoother decline and growth of overall industry profitability for the two most recent technological cycles.

For their role in the revenue cycle, console manufacturers also claim a royalty fee for each game produced on their platform, in the neighborhood of about $5-$10 per game sold. The PC platform does not impose this additional cost. Surges of interest in PC gaming generally occur at the declining phase of a console's technology life cycle, but as with any platform, the popularity of the PC as a platform is also heavily dependent on the quality and differentiation of PC games software. We can expect software development for the incumbent platform to diminish significantly in quality, but not necessarily in quantity with the announcement of a new system and during this time, game development activity on PCs may also benefit from renewed interest. As a general rule, however, PC game development has held steady over recent years.

Because personal computers are bought for a wide variety of uses and are generally not dedicated to gaming, nor do we have accurate and complete information on how many are purchased primarily for gaming, they are not usually included in hardware counts. After peaking in 2000, PC games sales has somewhat declined, but there is sufficient reason to believe that online gaming represents considerable activity for this sector, which is not being tracked. The penetration of the PC grows with income level, from about 55 percent for annual household income of at least $40,000; to over 70 percent as income approaches $100,000 or greater. The traditional profile of the PC gamer, as high income, technologically sophisticated males is also changing as the PC is becoming a mass market item and its owners are looking to equip their machines with entertainment software that has a lighter, or more casual appeal.

Exhibit II-g: Annual Hardware and Software Revenue
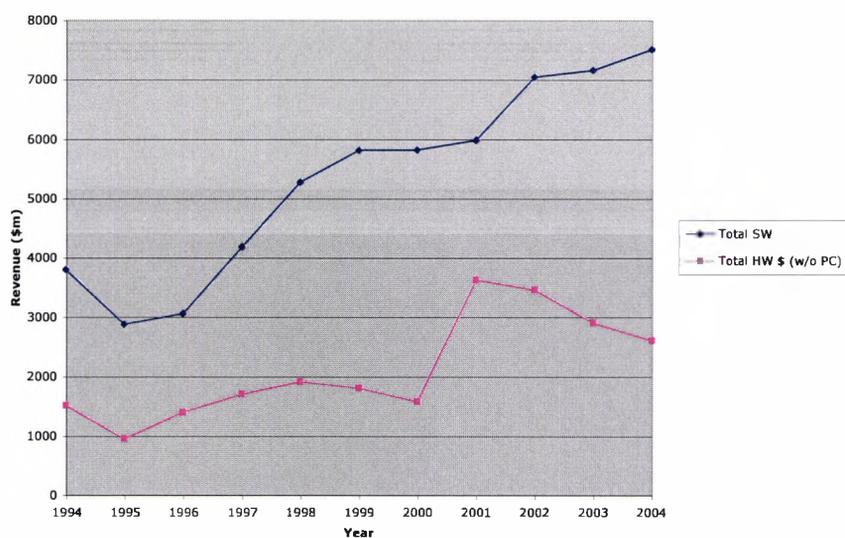
Sources: IDG Entertainment, DFC Intelligence, NPD FunWorld, The ESA

The industry's outlook is promising indeed. From 2001-2004, the US Interactive entertainment market had proven itself to be a $10 billion annual opportunity with over 250 million units of hardware and software products sold each year. Each subsequent generation of hardware has become user-friendlier and as we can see from Exhibit II-g, each has also effectively grown the software opportunity, which represents over 70 percent of the industry's revenue. The North American market for games software alone represents almost half of global revenue for the period from 1996-2004, at over $5.6 billion. Prior exhibits have already demonstrated how sales for the 16-bit generation peaked in 1993 and it was replaced in 1994 by the 32/64-bit generation. Following peak sales in 1998, this generation was subsequently replaced in 1999 by the 128-bit generation. Software revenue has peaked with about a year lag behind newly introduced systems and its decline in sales has also not been as dramatic. Thanks to hardware leader Sony's sound strategy, consoles are enjoying greater longevity than ever before and since 1996, software revenue has continuously increased.

The hardware market is currently phasing in the seventh generation of consoles, and has been shaken out to 3 competitors who are more diversified than it may at first be apparent. Although in a more general sense, hardware manufacturers are not as powerful as they once were, they still exercise considerable power over developers who are creating games with a dependency in the domain over which the manufacturer has inherent leadership, or a well-defined competitive advantage. For example, XBox is known for its cutting-edge technology, PlayStation 2 has the greatest mass-market appeal, and Nintendo has historically exercised greater control over product decisions so still retains a leadership position in the market for socially responsible games such as children's games.

The trend to be platform-agnostic has much to do with escalating costs and the inherent limits imposed by the installed base of each platform. In short, it is too difficult to sell at least a million units of a game and remain exclusive to a single platform when most of the users are spread across 3 different consoles. Exclusivity comes at a high price for console manufacturers who are forced to either subsidize developers to remain exclusive, or acquire key developers and locate the resources in-house as Microsoft did with Bungie Software. Because each platform has a very specific competitive advantage, which we may think of in terms of its *platform dominance* (Venkatraman and Lee, 2004), there seem to exist preferences at not just the level of customers, but at the level of developers as well. This does not dismiss the fact that developers are becoming platform-agnostics, but rather makes the point that they must surely have built-in preferences for platform, based on their target audience and desire to showcase their titles in the best possible light. PC-gaming and the market for handheld devices aside, these platform-based competitive advantages may make it unlikely that there will be convergence to a single console standard over the short-term.

CHAPTER III   THE CASE OF THE HARDCORE GAMER

The Internet and the organization of games' communities have made communication pervasive: Developers and publishers no longer rely only on traditional marketing vehicles with limited lifespans; users are able to communicate with others of like-minds instantaneously; and innovation, alongside opinion leadership is powerfully exercised in the games industry through the participation of a special type of user, or gamer, known as the *hardcore gamer*. As this chapter will demonstrate, hardcore gamers are, all at once, *innovators* (Bass, 1969; Rogers, 1962), *prosumers* (Toffler, 1980; Kotler, 1986), and *lead users* (von Hippel, 1986, 1988, 1994, 1998, 2001, 2005). While it is their similarity to lead users that is of most concern to this thesis and I later use the term hardcore gamer and lead user synonymously, the work completed by scholars in the previously noted areas is highly relevant and therefore helps to add a richness in understanding the characteristics of the unique user known as the hardcore gamer.

3.1   The Lead User – Origins of the Literature

Of widespread academic interest to innovation today are *lead users*, who can play a critical role in value creation by helping firms discover future customer needs (von Hippel, 1986) and generate valuable new products (Nerkar & Roberts, 2004). von Hippel (2005) defines them in the following manner: 1) They "are at the leading edge of an important market trend(s), and so are currently experiencing needs that will later be experienced by many users in that market." (2) "They anticipate relatively high benefits from obtaining a solution to their needs, and so may innovate."

In a sense, scholarly work on lead users has been an outgrowth of the literature on diffusion which has been in existence since at least the 1960s, when Rogers (1962) and Bass (1969) unveiled their adopter constructs and advanced the notion of diffusion as a social process

occurring through interpersonal networks. These authors categorized adopters on the basis of their innovativeness, which according to Rogers (1995) is "the degree to which an individual or other unit of adoption is relatively earlier in adopting new ideas than other members of a social system". Innovativeness was partitioned into discrete categories to support each of the theories advanced, with Rogers' taxonomy employing 5 categories (*innovators, early adopters, early majority, late majority,* and *laggards*), and Bass' model employing 2 categories (*innovator* and *imitator*) of adopters.

Lead users employ strategies such as early adoption, to stay ahead of trends (Franke & Shah, 2003; von Hippel, 2005) and accumulate knowledge that has been referred to as the "richest understanding of new product and service needs" (Herstatt & von Hippel, 1992). They are highly likely to produce new or modified products (Morrison, Roberts, & Midgley, 2004) and these products are likely to be deployed commercially (Franke & von Hippel, 2003).

Various authors, not just those attempting to identify the size of the lead user opportunity for firms, have tackled how the market is segmented between various classes of users. This quantification remains a bit of a conundrum, and it appears to be contextual to the theory advanced, and as a practical matter, to industry and type of product. In fact, single industry studies cite lead user representation ranging in value from 9.8 percent (Lüthje, 2004) to greater than 35 percent (Herstatt & von Hippel, 1992; Franke & Shah, 2003) of the user population, and in some industries, users develop the majority of innovations (von Hippel, 1976, 1977; Lüthje and Herstatt, 2004). Under Rogers' adopter taxonomy (1962, 1995) we may arrive at a number somewhere between the 2.5 percent he ascribes to the earliest adopters or *innovators* whom he describes as venturesome and highly knowledgeable, especially with regards to complex technical knowledge; and the additional 13.5 percent of adopters in Exhibit III-a whom he refers to as *early adopters*, that may contain a mix of lead users and the missionaries of the mass

market. It is worth noting that Bass (1969), whose innovator-imitator taxonomy is based on contagion theories was decidedly uncomfortable with Rogers' "arbitrary" quantification of these categories.

Finally, Toffler(1980) and Kotler(1986) have both promoted the earlier-referenced theory of *prosumerism* relevant to this discussion, that is gaining importance in practitioner circles, specifically for consumer market environments such as digital cameras, music, publishing, and computer and video games software[10]. In these markets, the distinction between organizational identity (insiders' perceptions) and organizational image (outsiders' perceptions) is at risk as the role of the user is closer to that of the producer in the value chain than to the traditional role of consumer. Rather than being passive targets, prosumers participate in actual value creation, which requires a remarkable integration of social context with production (Sicca, 2000), and the firms operating in these environments should anticipate impacts, most notably in the area of retailing, price unbundling, product design and appeals (Kotler, 1986). I argue that because this type of activity potentially promotes lead usage, in prosumer-oriented industries we should expect that the representation of lead users in the user population will be greater than average.

3.2   The Hardcore Gamer as a Consumer

If we envision the role of the user in a sort of continuum, the most traditional and simplified notion of the user is as a consumer, whose role is not to create value, but rather to consume the value that has been created by producers in the form of goods and services. An enormous body of consumer behavior literature seeks to explain how to understand and engage consumers; and theories of adoption, particularly concerning those users who are quick to adopt new innovations, are extremely helpful in understanding the hardcore gamer.

---

[10]   See Prosumer References in References.

Exhibit III-a: The Role of Consumption

PRODUCTION	PROSUMPTION	CONSUMPTION

(Toffler, 1980; Kotler, 1986; Sicca, 2000)

Imitator	Innovator

(Bass, 1969)

Innovators
Early
Adopters
13.5%
Early
Majority
34%
Late
Majority
34%
Laggards
16%
2.5%

$\bar{x} - 2sd$ $\bar{x} - sd$ $\bar{x}$ $\bar{x} + sd$
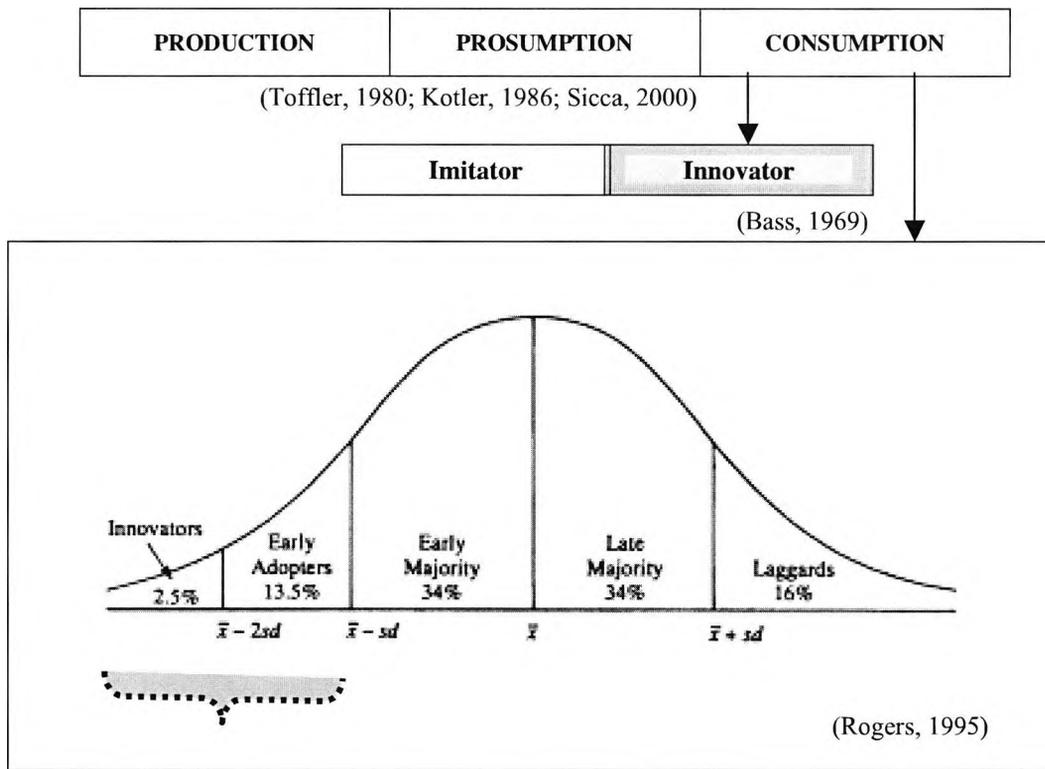
(Rogers, 1995)

As one might expect of *innovators* from the work of Rogers(1962) and Bass(1969), hardcore gamers possess knowledge about new technologies, game development methods, game design, game creators, the latest releases, as well as trends and developments in the industry. Hardcore gamers spend a high proportion of their leisure time playing games, and as a result, some practitioner definitions focus on this aspect of their behavior. For example, Ziff Davis' annual segmentation study classifies a *core* gamer as someone who has bought at least 3 games in the last 2 months, or bought 2 games and plays games 15 or more hours per week. Most insiders agree that the hardcore gamer is generally male (> 0.95); 15-45 years of age and the opportunity in the US represented by this age group is about 124 million. These are gamers who have been playing games for several years together, and often began doing so at quite a young age (Ip and Adams, 2002).

In the traditional definition of *hardcore gamer* in their role as consumers, hardcore gamers are contrasted with *casual gamers* and have a deep, but also a global view of the games industry. Certainly at the firm level there is a need to understand customer segments at more micro-levels, especially as management pursues the fine-tuning of purchasing and loyalty strategies. At least one case to employ a variety of classifications has been made in the industry with Ip and Adams (2002) study that uses 15 separate factors to segment gamers into 5 different classes, which range from *ultra-casual* to *ultra-hardcore*. Admittedly, dichotomies can forfeit an appreciation of the complexity underlying conceptual spaces, however, the hardcore-casual taxonomy has been used for at least a decade in the games industry and insiders still tend to agree that it captures the fundamental characteristics and differences between consumers.

Casual gamers, by contrast, play games purely for the entertainment they provide. For them, games are but one of a potential variety of ways they choose to fill their leisure time. On average, they prefer games with high entertainment value, so are drawn to games that feature only a low to moderate level of difficulty, and those that have shorter sessions. They may not play games for long periods of time, nor very often, and may not even identify themselves as gamers. Rewards in casual games need to be frequent, unlike many games that are tailored to hardcore gamers' preferences, which withhold rewards until the end of the game. Games appealing to the casual gaming audience are usually simple, based on familiar concepts, and are often turn-based games that can be played intermittently in short sessions (Kim, 2001).

My primary data collection also corroborated other industry studies that point out that hardcore gamers prefer to spend most of their leisure time involved with games. The estimated number of hours they devote to some aspect of gaming varies depending on whom you ask, but the estimate is still generally assumed to be a staggering figure. They play a great many games, including games from outside their own preferred genres, and own the popular consoles as well

as some outdated ones for nostalgic reasons. Owning the latest hardware and playing the new and important games are important to them, but so also are playing games from the past. Connecting in this way to the past seems to be important for several reasons: nostalgia; to build knowledge that conveys not just expertise, but reputation as a historian of sorts; and also purely as homage to the truly innovative. As one might expect of other users, hardcore gamers seem to have their own set of preferences, but unlike other users, that preference does not appear to stop them from playing, evaluating, critiquing, and having an influence on games from outside that set of preferences. In fact, the case of The Sims that I present later on in this thesis is testament to the impact hardcore gamers can have on the commercial success of a game not intended for them. Readers may gain a further appreciation for the hardcore gamer from the selection of quotes contained in Exhibit III-b, which was each a response to an online query regarding the definition of what constitutes a hardcore gamer, collected across a number of websites, and illustrates several different dimensions of this complex user.

3.3 The Hardcore Gamer as a Creator of Value

A second, and important lens through which to view the hardcore gamer is as a creator of value. In this role, we have academic literature that instructs us on how to proceed. As the profile of the user begins to depart from that of the con*sumer* and approaches that of the *pro*ducer in the value chain, the *prosumer* literature advanced by Toffler (1980) and Kotler (1986) calling for strategies that are mindful of the more active role these users wish to play in value creation, apply. The goals of prosumers are most notably customization to suit their particular needs, and to some extent, co-design, during which they oftentimes utilize user-friendly tools supplied by firms to design and produce products. Piller, Schubert, Koch, & Möslein (2005) refer to this as "defining, configuring, matching, or modifying their individual

solution from of a list of options and pre-defined components". Some industries are better suited for prosumerism than others, and games software is unquestionably among those industries that are inherently prosumer-oriented.

Exhibit III-b: Hardcore Gamer Quotes

There should be a certain amount of history in game playing if an individual is to be considered a true "hardcore gamer." I've been playing games since I was about 8. I'm 20 now. This history not only allows for one to be easily capable of speaking about the evolution of gaming, it also allows for one to learn new games more quickly.

"Matt D"   IGN.com

...the way I've heard it used...is mostly in buying patterns. Hardcore gamers buy different games and play them all the time, where casual gamers stick to a few games every now and then.

"Arkaeyn" IGDA forums

The real definition of a hardcore gamer is somebody who likes Videogames over everything else. Except maybe breathing. It's not how many systems you own or how much money you can spend in one sitting, it's about having a deep-rooted passion for games. That's hardcore.

"TreyTable" IGN.com

If someone was to ask me what is a hardcore gamer I would say someone who enjoys playing a variety of videogames. I think a hardcore gamer is someone who is interested in all aspects of gaming. They are interested in gaming news, how games are made, gaming companies, importing games.....the list can go on. But in a nutshell I think a hardcore gamer just has a genuine dedication to videogames.

"Princesszelda" Gamespot

Exhibit III-b: Hardcore Gamer Quotes (contd.)

The ultimate hardcore players become most fascinated with knowing the games inside and out on all levels, including and especially how far the game can be pushed until it breaks, and consider this form of discovery more interesting than anything intentionally afforded by design.

"J.theYellow" IGDA forums

For me a "hardcore gamer" is someone who loves and appreciates games, and makes it their business to know the latest news and upcoming games even though they may not be able to play as much as they want. They also buy lots of games.

"Scrubking" Cheapassgamer.com

Well, don't catch me wrong but I think a hardcore gamer is anyone who can, well, beat me at any game of your choosing. Yes, I'm pretty darn sure of my self but I have been playing games since I been able to pick up a controller and press buttons. I have not met people who really can "Beat" me at a multi player game even when the odds are up and they cheat and double team me. So wanna be a hardcore gamer then Beat Me.

"Travis" IGN.com

Any gamer who has played videogames since they learned sub-basic motor skills, and who go into the past, before they were born, and play every retro system out there.

"H4rd(0r3 fo' 3v4" Urbandictionary.com

A gamer who is very serious about gaming, considers gaming a primary hobby, is very familiar with games, and also plays a LOT of hours per month. I will arbitrarily assign 100 hour/month as the defining amount.

"Sharpe"   quartertothree.com

I once beat Final Fantasy 3 (for NES, not FF6 in US) back in 1992 without looking at any walkthru...I didn't understand most part, spent 100 hours, but beat it. Now, that's hardcore! (I even learned some Japanese) Ahh...I almost cried when I saw Wind Crystal shining in the sky...

Anonymous IGN.com

Lead usage also concerns user value creation, and in doing so, specifically addresses the role played by lead users in innovation. Strictly employing von Hippel's definition (2005), hardcore gamers' characteristics model those of lead users: 1) They "are at the leading edge of an important market trend(s), and so are currently experiencing needs that will later be experienced by many users in that market." (2) "They anticipate relatively high benefits from obtaining a solution to their needs, and so may innovate."

In the first instance of the lead user definition, hardcore gamers are recognized as the innovators (Bass, 1969; Rogers, 1962) and early adopters (Rogers, 1962) of the games industry, and other hardcore gamers, casual gamers, and the industry's producers seek their opinions. Because they tend to be so far ahead on the adoption curve, they often participate in providing technical support and other user support services, of their own volition. In an already prosumer-oriented (Toffler, 1980; Kotler, 1986, Sicca, 2000) industry, the profile of the hardcore gamer lies close to the producer in the value chain, and it is not surprising that many of these users also earn a livelihood within the industry, or have aspirations to do so. Hardcore gamers are involved early in a product's development: they can be guides to producers during concept development and most often during testing, even for games not intended for them.

Exhibit III-c: The Role of Value Creation
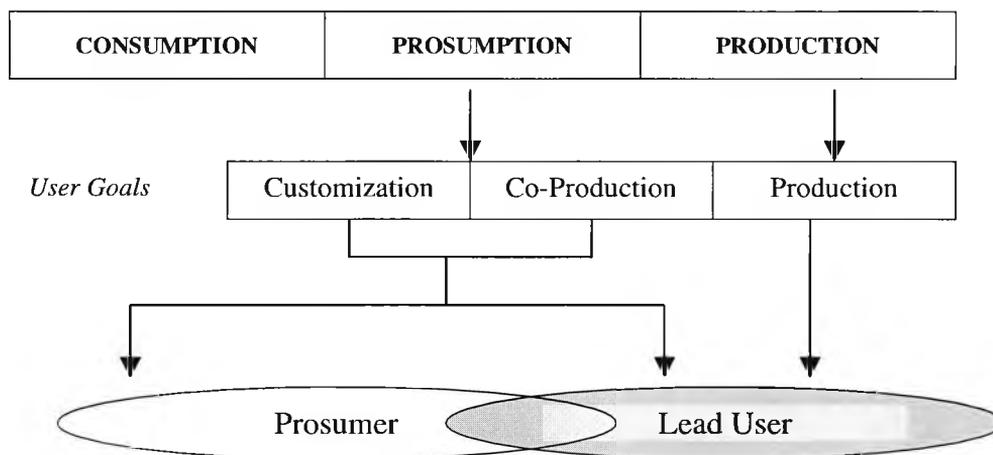
The influence of the hardcore gamers is highly pervasive in games software and managers must consider how firm strategy impacts this community for at least 3 different and highly important reasons: 1) Hardcore gamers are often involved in concept development and as testers in early stages of product development, in what is known as "the Fuzzy Front End[11]" or simply FFE (Reinertsen & Smith, 1991), so unless firms make deliberate choices to screen them out, hardcore gamers can be in a position to affect a game quite directly from the FFE through to commercialization. 2) Hardcore gamers have many opportunities to exercise opinion leadership on the casual gamer market, especially through online communities, technical/user support, and other forms of opinion leadership, including word of mouth. In fact, hardcore gamers have been known to construct and wholly manage websites of their own at what appears to be staggering costs in time and effort to support a game, a game's community, a developer, or the gamer community in various ways, such as providing helpdesk types of services, reviewing games, and compiling information and databases of one sort or another. The most common point of contact for this community is through the developer or directly with the product. 3) Hardcore gamers, as the literature on lead usage attests, are also inextricably linked to innovation: as game creators, game modifiers, and as vital links to the diffusion of innovation.

In the second instance of von Hippel's definition of lead users, hardcore gamers do create original games but their impact on the market has been enormous in their "desire to modify or extend games in a creative way" (Ip and Adams, 2002) and the benefits they draw from this innovation are both competitive and reputation-based. Hardcore gamers innovate through a variety of mechanisms: By making relatively "simple changes, such as giving characters new *skins*" that effectively change their appearance, or by complex innovations such as the programming of "aim-bots" which result in unfair play-related advantages (Ip & Adams, 2002).

---

[11] 'Fuzzy' emphasizes the ad hoc or ill-defined nature of these early activities.

Competitive play, with clear objectives, and mastery of the game is an important part of the experience so spending a great amount of time on a new game to develop this mastery is common in the hardcore gamer community. Adams (2000) speaks of the "exhilaration of defeating the game" compared to the casual gamer's "sheer enjoyment of playing the game". Hardcore gamers therefore are most stimulated by games that are not just unique, but also difficult, deep, and complex, so tend to engage in play over many long sessions (Kim, 2001). Their own innovation springs from wanting to showcase their skills; to better their chances of defeating opponents, which may include the game itself; to improve the game or lengthen their experience with the game; and to understand the game at such a detailed level that they become capable of making it an even better experience.

Through "mods" or modifications that perform functions not intended by game creators or entities with the actual rights to the game, hardcore gamers can add new content to existing games or create entirely new games in themselves. Mods allow users to tinker with a game if they do not like the way it was released, or if they grow tired of the game over time and want to "breathe new life into (their) old favorite" (Kassis, 2006)

Since mods are increasingly recognized as important to the commercial success of many games, developers such as Valve Software and Epic Games for example, follow the Open Source model and provide extensive tools and documentation to assist such innovation. There are many instances of the rights to mods of a title being purchased by its developer or publisher, who subsequently makes the mod available at point of sale. Perhaps the most well-known of these is Counter-Strike, the multi-player mod to the game Half-Life, that began hosting 1 million games per day on dedicated servers and drove the sales of Half-Life for years.

Kassis (2006) describes the draw behind mods: "If you want to assemble a mod, you take some changes to the characters' appearances ("skins" or "models"), throw them into an

original environment (a map), give them some real-world or fancifully created weapons, and let them have at it. Gamers can introduce their favorite weapon, article of clothing, or National Park into a software title on a piecemeal basis when the need arises, of course. But when you put those elements together into a cohesive package, well you have a mod on your hands, - actually, on your hard disk. If hacking code isn't your idea of fun, the Internet is replete with digital enhancements created by enterprising, hardcore gamers looking to share their creations with their fellow gibbers. There are mods for all of the most popular shooters, like Half-Life, Tribes, Aliens vs. Predator, and Soldier of Fortune. Fans of strategy games, such as the Rainbow Six and S.W.A.T. series, can also get a hold of some choice mods. And there are a few superb Web sites out there (Telefragged, FilePlanet) that will put the downloadable goodies a few mouse-clicks away".

To quote von Hippel & Sonnack (1999), "if you want to find users that are actively exploring and testing new ideas, it is a waste of time to survey users in the center of the target market. Instead, you must develop methods to seek out users that are at the leading edge with respect to needs that are important to that market – even if such lead users are rare and hard to find - because that is where interesting user idea generation and innovation is concentrated.

Hardcore gamers are highly involved, vocal, and extremely knowledgeable about games and the game development process, industry trends, technological tools, and perhaps even propelled by self-interest, they accord importance to celebrity and take pride in amassing knowledge about game creators. Although more recently their representation as a percentage of the total number of gamers has declined, which Ziff Davis estimates to be about 18-25 million, games software is still unquestionably dominated by hardcore gamers in terms of the influence given to their opinions and actions, by the industry's producers and other users.

To summarize, hardcore gamers are intimately involved in the games development process: As guides during concept development, as testers during various stages of game development, as game modifiers, as part of the technical assistance or user support network, and as game creators themselves. As with other users, they seem to have their own set of preferences, but unlike other users, that preference does not appear to stop them from playing, evaluating, and critiquing games from outside that set of preferences. In short, because the basic understanding of hardcore gamer characteristics appears to be generally in line with academic work on lead users (von Hippel, 1988; 1998; 2005), I treat them synonymously.

Two caveats are nevertheless in order: First, a precise and standardized definition is lacking in the industry, so practitioner reports do not always employ rigorous definitions and tend to use arbitrary identifiers for what constitutes a hardcore gamer such as the number of games purchased and the number of hours spent playing games. Second, because a rigorous definition is lacking, some practitioners have more recently taken liberties with the application of the term *hardcore gamer*, and have begun using it more indiscriminately and narrowly: to describe avid fans of particular genres (e.g. hardcore sports fans) with interests in only particular types of games, and even entire franchises (e.g. hardcore Madden NFL fans), rather than to describe a traditional hardcore gamer who is capable of driving broader-based trends, innovation, and the market.

This narrow application is not my intent. My own application of the term in this study is in the more traditional sense, which is compatible with the lead user as described in the literature. Although we should anticipate true hardcore gamers must have preferences and a *hardcore Madden NFL fan* may very well be a subset of the larger hardcore gamer group, the more

traditional viewpoint is that hardcore gamers are largely platform-agnostic[12], play a large number of games each year[13], including international releases in foreign languages[14], and are capable of appreciating creative contributions even outside their set of preferences, be it a genre, franchise, or particular game.

3.4 User Trends in Games Software

Hardcore gamers have shown that they are able to steer producers, even producers of games not originally intended for them as we shall later see with the case of The Sims, to commercial success. Their opinion leadership and high-visibility has sensitized producers to the need to partner with them, and to the risk that mismanaging the relationship can bring, however others have identified pitfalls of this relationship.

Brad Wardell (2003) argues in his postmortem of *Galactic Civilizations*, that it is easy for developers and publishers to allow hardcore gamers to have a disproportionately large effect on game development, even for games intended purely for the mass market audience. Independent developer Alex Austin (2004) from Chronic Logic argues that Looking Glass Software failed because of its focus on the hardcore segment, too many of whom he says consider themselves "too smart to actually pay for something". Satoru Iwata, president of Nintendo, has long cautioned the industry that such a heavy focus on hardcore gamers preferences may alienate casual gamers and potential new gamers who represent the true financial opportunity in the market. For example, games that feature difficulty and complexity from tightly sequenced

---

[12] It is believed that over 90 percent of these users own a PC and almost all of them own multiple systems. (DFC Intelligence, 2004)

[13] Megagames estimates that this number is in excess of 100 games each year, which includes all the latest releases. http://www.megagames.com/hardcoregamer.html

[14] Foreign languages may not be a deterrent to playing a title released in another country. See final gamer quote in Exhibit III-b.

gameplay and a need for lightning reflexes may adversely and permanently impact the confidence and enjoyment of new users. (Nizumi, 2005).

An important shift has occurred concerning the representation of hardcore gamers over the past 5-7 years. As a result of the industry's astounding growth, the affordability of hardware, and the relative stability of platforms due to backward-compatibility of critical hardware over the period of the study, the role of mass-marketing and the casual gamer have gained significance, while the hardcore gamer's share of representation in terms of the total user market, has diminished. Striking evidence of this occurred in 1998, when the low-technology, low-cost, low-priced Deer Hunter title was launched to Wal-Mart's distribution, and suddenly a game which the hardcore gamer would surely have ignored became the second-highest selling PC title in 1998. Its success trounced that of Myst, a game that is still considered amongst the most highly innovative by gamers and industry veterans, and which sold a highly respectable, 4 million units in that year. Deer Hunter was aimed squarely at Wal-Mart's shoppers, at a value pricepoint that made sense for them. It cost a remarkable $70,000 to develop, and was designed in only 3 months. Chapter VII discusses the particular case of Deer Hunter further.

Game industry insiders and analysts currently agree that the market is saturated for games purely targeting hardcore gamers' interests, and that there are far too many firms competing for this discerning gamer's attention (Adams, 2000). With solid proof now that the casual gamer represents a highly lucrative and large market opportunity, there are many companies rethinking their business formula and designing games for casual gamers, who enjoy video games for moderate and occasional enjoyment. However, unlearning the old rules has been hard and the interactive entertainment industry is discovering they are now drawing in consumer experts from other fields to help them overcome their fear of implementing a strategy that offends the hardcore gamer.

For example, when designing games for the new mass market of casual users, Marc Ecko[15], who is also a highly successful entrepreneur from the urban fashion world, argues for segmented gameplay. "Masses divide their consumption times based on the years of conditioning from television and film -- half hour, to one hour, to one-and-a-half hours. It's a fact", he says. As to the importance of the technology, he cautions, "None of that matters to the guy watching. It's all just a stage. He simply wants to be entertained and it's our job to know how to do so." Ecko's concern is that many publishers and developers make the mistake of satisfying hardcore preferences and erroneously assume that everything easily translates to the consumer culture, when the real challenge is to simply "demystify the code".

---

[15] http://xbox.ign.com/articles/584/584640p1.html

Chapter IV THEORY AND HYPOTHESES DEVELOPMENT

While there is little disagreement that it is difficult to predict the source of discontinuous change, the literature on innovation has cautioned firms against listening to their customers (Christensen, 1997), then more recently embraced the tracking of an important group of customers known as *lead users*, to guide organizations to successful trends ahead of the market (von Hippel, 2005). According to von Hippel (2005), lead users are identified by "two distinguishing characteristics: (1) They are at the leading edge of an important market trend(s), and so are currently experiencing needs that will later be experienced by many users in that market. (2) They anticipate relatively high benefits from obtaining a solution to their needs, and so may innovate." In other words, the benefits to producers from accessing lead user knowledge is a direct link to commercially successful products, as well as to innovation in a more general sense.

Customer involvement has been common in the business-to-business or industrial products market, where feedback loops are much more structured, and organizations operating in industries such as aircraft manufacture, semiconductors, and defense have traditionally included lead customers in product development. Recent literature has demonstrated the importance of accessing lead user knowledge in consumer products markets (Shah, 2000; Lüthje, Herstatt, & von Hippel, 2002; Franke & Shah, 2003; Lüthje 2004), empirically validating what to this point had been mostly regarded as anecdotal evidence.

Practitioners testify that what at first glance appears to be *free* innovation from the involvement of lead users is actually a rather expensive and risky activity, and the academic literature corroborates the need for new management approaches and business models (von Hippel, 2001, 2005; Jeppesen & Molin, 2003; Magnusson, 2003; Jeppessen, 2005; Shah, 2005;

Lüthje, Herstatt, & von Hippel, 2005). For instance, von Hippel (2005) states that with the involvement of the lead user into the value creation process, "Open, distributed innovation is "attacking" a major structure of the social division of labor" and the shifts are "painful and difficult for many manufacturers". He claims that for producers, the lead user approach results in "major changes in their business models, and important changes in industry structure may also follow."

It cannot be held that all industries, all firms, nor all products have lead users. For consumer goods, on one hand there are markets like digital photography and games software that are highly saturated with this type of usage, and are concordant with the prosumer model. On the other hand, in markets for some convenience and low-involvement goods, lead users may be conspicuously absent.

If lead users exist in any significant numbers, producers would benefit most if they are motivated to self-identify themselves; engage other lead users to learn and to sort out issues with minimal reliance upon producer support; and be willing to share the resultant innovation and learning with producers. Access to engaged lead users who are willing to share their knowledge through minimum producer effort has important cost benefits and strategic considerations for the firm, yet empirical evidence on "promising actions and decisions when working with lead users" is scarce (Lüthje & Herstatt, 2004) and the question of how to organize internal resources to engage the lead user community is not yet addressed adequately in the literature, yet this organization has enormous significance to strategic management.

Quite simply, without a sort of self-engagement in place on the part of lead users, the processes to identify them, understand their needs, and satisfy them on an ongoing basis can be highly involved, expensive, and time-consuming. Negotiations and the construction of rewards and incentives may become both complicated and expensive exercises. Traditional incentives

such as financial rewards do not tend to work with this community; accessing their knowledge to test its commercial viability is complicated by *stickiness* (von Hippel, 1994; 1998); and although a case has been made for free-revealing (Franke and Shah, 2003; von Hippel, 2005), lead users are not always willing to share their knowledge with organizations (Lüthje and Herstatt, 2004; von Hippel, 2005). Successful incentives are thought to involve some mix of peer recognition, reputation, network effects, product improvements and product availability (Franke & von Hippel, 2003; Lüthje, 2003; Lakhani & Wolf, 2005; Henkel & Thies, 2003; von Hippel, 2005). For instance, access to exclusivity and obtaining the commercialized product ahead of the market, have been shown to be motivators for lead users, especially in the industrial market (Brockhoff, 2003).

There are three separate, but inter-related points to be made regarding the positioning of theory in this document, given the context of games software:

o   Firstly, because traditional incentives do not tend to work with lead users, who have shown themselves to be self-starters, driven by their interests, an essential component of strategies designed to align an organization with lead users and tap into their knowledge must be concerned with understanding what drives their interest. By building in lead user interest, so that it is an inherent part of the firm's strategy, I argue that management can potentially draw in, as opposed to seek out, these powerful external allies, who are prepared to work, communicate, and innovate on the firm's behalf.

o   Secondly, in the games software industry, in which high-visibility, lead usage, prosumerism, user toolkits, ubiquity of communication, visibility, and both producer-supported and user-supported communities are already highly prevalent, identity is a critical consideration for lead users, and potentially one that can be used to capture lead user interest. Given limited lead user resources, the strength of their identity-based considerations, and heterogeneous

firms and products, I assume that these users will prefer to align themselves with some entities and not others. While some organizations struggle to even make contact with lead users, there are firms like Apple Computer, and id Software that have long-benefited from strong ties to their lead user communities, and feedback loops that almost seem to run concurrent with innovation. Examining these environments indicates that there may be benefits to organizing resources to appear more aligned with and therefore attractive to lead users, at least for the reduction in costs and effort it may otherwise take to engage them.

o Thirdly, the literature instructs that self-concept, product identity, and organizational image are intertwined, so I argue that lead users' identity as unique, innovative entities are reflected in their interests: A product whose direct identity considerations (e.g. quality) or indirect identity considerations (e.g. the identity of its producers) more closely mirror lead users' identity as innovators, should be of greater ongoing interest. As such, these considerations may be examined as determinants of lead user interest in products. Understanding the factors that drive lead users' interest in individual products is a major objective of this thesis.

The rest of this work takes the viewpoint that any acknowledgement of lead user importance to strategy is surely incomplete without some study of the contrasting view, which in this case is an understanding of the limitations or pitfalls of overstating the importance of lead users to producers. There is potential for this misalignment, and although the literature informs us of the importance of the lead user to an organization's innovation, learning, product development, commercial implementation, and profitability (von Hippel, 1986, 1988, 2005; Shah, 2000; Lilien, Morrison, Seals, Sonnack & von Hippel, 2002; Lüthje, 2004; Lüthje & Herstatt, 2004), we have not examined at any detailed or empirical level, whether there are circumstances in which we should ignore the opinion of lead users, or at least treat their opinions with a great deal

of caution. In other words, are there circumstances in which companies are in fact led astray by "listening to customers" as Christensen (1997) claimed in his Innovator's Dilemma?

4.1 Hardcore Gamer Identity: Theory-based Considerations

There is very clear indication from secondary data on the games industry and my own primary data collection, that identity is an important consideration for hardcore gamers and that although these users tend to be well-rounded in terms of the games they play and preview as well as the creators whose work they follow, preferential attachment based on identity considerations appears to exist for them.

This section discusses the links scholars have made, intertwining identity of the self, and that of both products and organizations. For the specific context of games software, we should expect that hardcore gamers' identity as unique, innovative entities should be reflected in their interests. Also, because what we may refer to as their *gamer-self* or equivalently their *lead-user self* is quite central to hardcore gamers' self-concept and therefore strongly manifested, we can make the case that their identity and the image of the products they demonstrate interest in, as well as the image of the creators of those products, are tightly connected.

The implications of a particular *self* being central is notably covered in social psychology theory, in which the concept of self is multidimensional with classifications that permit organization, and the drawing of distinctions between others and oneself. Distinctions may be made at the level of individuals (self-identity) or the level of groups that represent affiliations with specific meanings from the various aspects of one's environment (social identity). For example, a person may be both a jazz musician and a churchgoer, permitting association with

potentially numerous groups, such as musicians, lovers of jazz music, *night-owls[16]*, other parishioners, and religious-minded people from other beliefs.

In self-identity theory, drawn from the sociological tradition, the organization of self is the way *discrete identities relate to one another* (Stryker and Serpe, 1994) and it is generally agreed that the organization of role-identities is hierarchical (Stryker, 1980; McCall and Simmons, 1978; Rosenberg, 1979). Furthermore, the *salience*, or perceptual importance[17], of the identities determine what degree of prominence they are conferred in the hierarchy. McCall and Simmons (1978), for example, define a situational self and an ideal self, that are situated in hierarchies of salience and prominence, respectively. Stryker and Serpe (1994), on the other hand, theorize the hierarchy is based on identity salience, defined as invocation readiness. In short, cognitive schemes are utilized to locate the identity.

Social identity theory has its roots in the psychological tradition, and concerns itself with the explanation of group processes and intergroup relations. Under this theory, each social category to which a social entity is affiliated (such as that represented by a community of users of games, i.e. *gamers*), provides self-definition and is represented as a social identity that is descriptive, prescriptive, and evaluative. Two sociocognitive processes that are important in our understanding of social identity theory are 1) *categorization* which helps draw distinctions within one own's group of say, hardcore gamers, (in-group) and that of other groups, which in this case would be casual gamers (out-group). 2) *self-enhancement*, which results in favoring the in-group, or having a positive self-concept, through strategies such as negative positioning of the out-group, as well as bolstering the in-group. Harrison White (1992) offers that social networks and the interaction that occurs through them, provides the basis for identity-formation. Control, in White's terminology, is to maintain a positive identity by eliminating threats. It is

---

[16] According to Wikipedia, night owl is a term for a person who tends to stay up until late at night and may have a preference or habit for staying up late.
[17] Miniard, Unnava, & Bhatla (1989), in their study of brand name recall offer that salience is *the prominence or level of activation in memory*.

generally accepted that when faced with such threats, actors engage in fight, flight, or creativity. Rao, Davis, & Ward (2000), in their treatment of discrepant cues that arise from in-group NASDAQ members exiting to join an out-group (NYSE), refer to these categories as social change, social mobility, and social creativity. For readers with interest in a deeper level of understanding of identity theory and social identity theory, that includes a systematic comparison between the two, I refer you to Hogg, Terry, & White (1995).

Extant theory allows us to make the connection between the prominence of the gamer-self, and how products and producers of those products might relate to a hardcore gamer's identity:

- o **Products and self-concept:** Congruence between product preferences and self-concept[18] has long been recognized in the consumer behavior literature (Sirgy, 1982, contains a review), so it is not unreasonable to expect that in industries such as interactive entertainment, in which the level of consumer involvement is high and the gamer self is quite central (Folkes and Keisler, 1991), that the strength of the product-self image relationship is of consequence.

- o **Producers and self-concept:** Extending these concepts to the organizational level is also not new. As Aaker (1996) points out, there are many organizations such as Sony GE, and Nintendo, for which what he calls the *brand-as-product* perspective dominates their identity and there are also products, such as M&Ms, Tide, and Magic: The Gathering, whose strong focus causes the organization to be largely invisible. I capture some of these relationships in Exhibit IV-a that follows.

---

[18] I employ Rosenberg's definition(1979, p.7) that self-concept is "the totality of the individual's thoughts and feelings having reference to himself as an object".

Exhibit IV-a: The Connection to Self-Concept
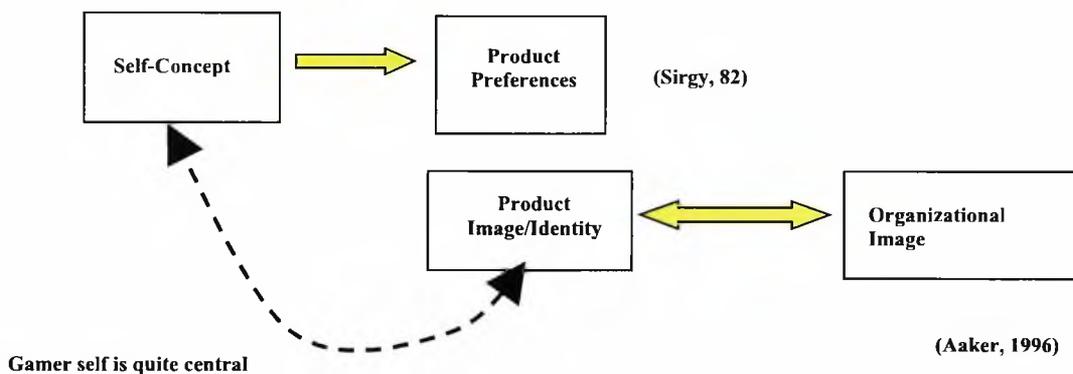
I make the case that for the lead users of the games software industry, the gamer-self probably contains strong elements of a desire to be thought of as innovative (self-identity) and also to be associated with other hardcore gamers (social identity). Also, reflecting on my own data collection, there is considerable supporting evidence indicating that a hardcore gamer's identity is both inwardly and outwardly focused. There appears to be a great deal of personal satisfaction and joy drawn from being associated with ground-breaking games or innovative producers even if the association has to remain behind-the-scenes due to non-disclosure agreements that prohibit public disclosure so they cannot demonstrate expertise, engage in debates, and fuel the interest of other gamers. Nor should it come as surprise that playing, mastering and even being associated with the game *Titanic: Adventure Out of Time* is likely to elicit a far different impact to a gamer's identity compared to *Doom* or *Diablo*. A respect for innovativeness comes through quite clearly from this community, and it may be that this respect allows them to appreciate innovative creators and games that may have been targeting an out-group. While there may be no higher honor for a hardcore gamer than to be associated with the launch of a product created by programming legend John Carmack, hardcore gamers are still heavily represented at industry events that allow a preview of the work of Will Wright, who is

most famous for The Sims, a highly creative game franchise that targets the female and casual gamer markets.

We should expect that other game categorizations including genre, organization, year of launch, and franchise may also affect identity. For example,

o A first-person shooter game is likely to be more strongly associated with the hardcore gamer identity and a puzzle game, more with the out-group of casual gamers.

o The organizational identity of id Software is more closely aligned with the in-group of hardcore gamers than Nintendo, which in many ways is still aligned with the children's market for games, although Nintendo has been trying to reverse that image for years.

o A top selling game 10 years ago was more likely to be a hardcore game and a top-selling title in the last 5 years more likely to be a franchised or licensed product that is not based on original content.

Exhibit IV-b: Assumptions behind the Hardcore Gamer Identity
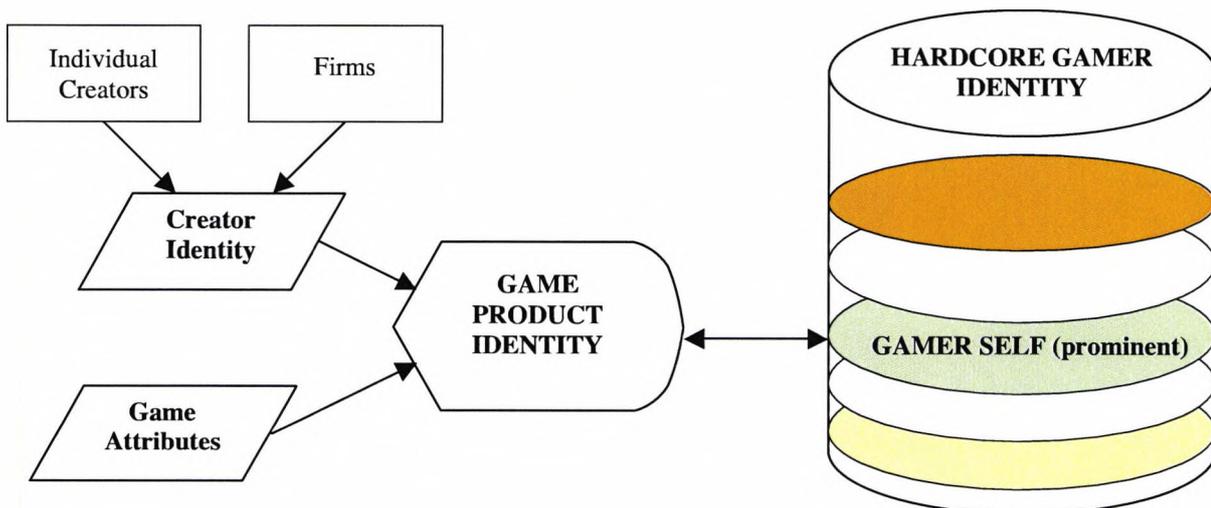
At the most basic level, I begin from the premise that a game is a manifestation of knowledge that is capable of owning a distinct identity in the market. Adapting from the

definition of self concept (Rosenberg, 1979) I propose that the totality of feelings and thoughts, that a gamer has concerning a game as an object, constitutes a game's identity.

As illustrated in Exhibit IV-b, a game's identity may be thought of coming from two major sources: 1) **The game itself**, or the components of the game and the interactions between them that affect its identity in a very *direct* sense. This includes the physical or tangible choices producers made in creating the game, that combines such elements as technology, artistry, quality, and physical game attributes to result in a unique experience for players. 2) **The identity of the game's creators** or producers, which is a more *indirect* element of the game's identity. In the games industry, hardcore gamers' knowledge of games, which includes knowledge of games' creators, is extensive, and producers can be firms as well as individual game creators. Unquestionably, the identity of game creators like John Carmack and Will Wright who are discussed in detail later in this thesis is each tightly linked to the products they are associated with, in much the way Steve Jobs of Apple Computer is connected to the iPod product.

Building in preferential attachment at the level of brand enables a strong foundation for user interest in products and to do this, I argue that firms in games software have opportunities at the product and by extension, at the organizational level. Not surprisingly, one of the more popular measures of brand equity, EquiTrend, developed by Total Research, specifically includes a component termed *salience*, that demands consumers hold an opinion about a brand, beyond merely recognition, awareness, and recall. What is *salient* is quite simply, what is of perceptual importance to an individual or to a group of any sort. There has been a fair amount of work in the social sciences and in the marketing tradition, on the implications of salience relating to various streams of research, most notably those covering identity theory, political voting, and

communication of the type encountered in advertising, and branding[19]. In a similar manner to the work in these disciplines that make a case for people's decisions and actions such as to vote based on the salience of a candidate's platform to the voters' own lives, or to purchase a product based on the salience of the brand and the like, it follows that lead users should be predisposed to partnering with firms that have products that are salient to them.

Salience, at its core may be thought of as a measure of **interest**, vis à vis other competitors in a given space. Since we know lead users have insight on valuable new products, the opportunities of the future, important market trend(s), and lead the market on "needs that will later be experienced by many users in that market" (von Hippel, 2005), knowing what is of interest to this group is clearly critical information. And, since we have strong corroboration from management scholars that the innovation of the future is based on the past, knowing which products lead users continue to be interested in, may be important signposts for the opportunities of the future, for in these products may lie future opportunities.

4.2   Development of Hypothesis I: The Notion of Independence

Given that identity is an important consideration for lead users in the games industry, and there is scholarly work that links users' self-concept with the identity of products on the one hand and that of producers on the other, lead users should be attracted to those products perceived as innovative, and products from producers who are likewise perceived.

There is compelling evidence in the literature for preferential attachment to reputable members of a network (Verspagen & Werker, 2004) or owners of key resources (Gay & Doussett, 2005), and the concept of *homophily*[20] (McPherson & Smith-Lovin, 1987; McPherson,

---

[19] For instance, see Sirgy, 1982; Fleishman, 1986; Miniard, Unnava, & Bhatla, 1989; Edwards & Mitchell, 1995; Humphreys & Garry, 2000.

[20] "Homophily is the tendency for people to associate and develop friendships, marriages, work relationships, etc. with people similar to themselves. Various demographic characteristics, like age, gender, socio-economic class,

Smith-Lovin, & Cook, 2001) makes a strong case for attraction between entities that perceive they are similar. Without an inherent preference for attachment or some clear advantage, lead users may not see any benefit in involving the producer at all. Markets for games and open source software enable users to participate in testing, support, and product development, and gamers do so, often at great time and personal expense, which they may see as potentially increasing with producer involvement. Furthermore, the derived benefits may be financial or result in a competitive advantage that lead users may be unwilling to share for fear of compromising their position.

An important equivalent term for innovation in the games software industry is contained in the concept of the *independence* of producers, which is an outgrowth of its use in other cultural industries, notably film, music, and publishing. In these industries, the independent firm has been described as being independent of the support of a major studio, label, or publisher: An underdog, operating with a much smaller budget that is often bootstrapped, or financed without the assistance from external capital. Probably for these reasons, the independent firm is also thought of as being unencumbered by what is perceived as constraints to creativity such as those that result from incumbency, establishment, and size. In this tradition, as games software grows into more of a mass market and sequelization is commonplace, the independent games developer or *indie* developer is perceived as a symbol of hope for the industry: a source of innovation that has the freedom to be creative and has a genuine passion for innovation. In fact, the recent need for large budgets as discussed in Chapter II continues to raise concerns at the major game development conferences in the last 5 years about plummeting indie developer survival rates and the effect on innovation in the industry.

---

ethnicity, education, occupation, etc., can provide boundaries around relationships. An individual's beliefs and values (i.e., religious, political) can also be influential." (Wikipedia, 2006)

From this discussion, readers may assume that independence is factually based so is quite straightforward to ascertain: that is, a producer is either independent or is mainstream based on financing structure; however this is not entirely the case in games software, where there is evidence that the term is also used as a proxy for innovation. My own study in this particular area indicates that this looser definition may be as a result of blurred boundaries between firms and the degree of mergers, acquisitions, and partnerships in the industry.[21] While *independent* is still used in the original sense of referring to the firm's financing model, especially for new entrants, prior indie developers who have since been acquired or that today have transitioned into strong partnerships with large, mainstream firms are sometimes still perceived as independents. The continuing perception seems to have something to do with either the degree of the perceived integration of the independent into the more established firm; possibly the creative latitude the independent is given since the marriage; or based on hearsay in the industry. Even with a number of participating brands in the development of a game, products are clearly perceived as independent or mainstream, evidenced by the unanimous agreement between raters in my own work, as readers will discover later on.

I treat the term independent as a proxy for innovativeness in this study, and as such independence is associated with a producer's reputation. We already know that one of the positive organizational outcomes that can arise from innovation is an enhanced reputation (Howell, 2005). A firm generally viewed as innovation-producing has been defined as "one which is continuously learning, adapting to changes within itself and in its environment, and successfully innovating in that environment" (Shepard, 1967).

Substantiated in part by the role played by the independent film maker in advancing innovation in the motion picture industry, I argue that to the extent a product is created by

---

[21] Readers may gain an appreciation for this activity based on the evidence contained in Appendix III.

producers (individuals or firms) with a reputation of being independent of conventional or mainstream production, it will be in an advantageous position to be perceived as innovative or unique, and therefore attractive to the lead user community. As a result, these products will be of greater interest or *salience*[22] to lead users, vis à vis products of similar standing from non-independent creators.

H1:   *Products whose creators are perceived as independent will be of significantly greater interest to lead users than products whose creators are perceived as non-independent.*

Reputation has been referred to as a "kind of summary statistic about the firm's current assets and position and its likely future behavior" (Teece, Pisano, & Shuen, 1997). In game theory, a firm's reputation is concerned with others' beliefs about "type" of organization and strategic management research assumes the competitive importance of external reputations (Rumelt, Schendel, & Teece, 1994). Lechner and Dowling (2003) posit, "Knowledge and innovation networks are a function of reputation and management capacity".

Users' perception of an organization's reputation may have been amassed as a result of contact on any number of fronts: direct or indirect contact with the firm, its employees, suppliers, customers, or its products; anecdotal evidence; and information that becomes available or is a spillover into the public domain. A company's prosperity and survival, it has been argued, depends on the support it can attract from customers, employees, investors and the government and to assess their standing in this regard, many firms are now measuring what is known as their *reputation quotient* (Grant, 2005).

A key vehicle to build a positive reputation and a brand image is through the product (good or service) offering of the organization (Cravens, Oliver, & Ramamoorti, 2003). That

---

[22] My use of the term *salience* is in the general sense of what is of perceptual importance or of interest to users.

brand influences consumer preference for differentiated products is not new, and more recently we have confirmed that consumers treat products from the same brand as roughly proximate (Hui, 2004). Reputation has been linked to enhanced performance (Baum et al., 2000; Verspagen & Werker, 2004; Hayton, 2005); to distinct advantages including enticement of customers, investors, employees and suppliers; as well as to the ability to command higher product prices and the ability to better withstand shocks (Fombrun, 1995). Griffin and Page (1993) have reported that unlike academics, who tend to investigate product development performance at the firm level, managers measure and want to more fully understand product success.

4.3 Development of Hypothesis II: Adding a Sociological Approach

In the context of games software, I expect the industry's lead users known as hardcore gamers will exhibit preferential attachment to products from creators perceived as mirroring their own identity as innovators. As we have just seen in the prior section, one way they might do this is through interest in products from creators classified as *independent*. In this section, I make a case for attachment based on a producer's particular positioning in social space. As such, I argue that products from entities perceived to be uniquely positioned to innovate in social space will benefit in terms of being of greater interest to lead users than those from entities perceived as too conventional, as we may expect of most successful mainstream producers; or too peripheral, as we may expect of overly creative firms who have not realized their invention in terms of successful commercialization, so that their products remain outliers. The work of scholars such as Schumpeter (1934) and Roberts (1988) remind us that the economic value of an innovation lies in the way an invention is put to commercial use.

Social network analysis is a critical part of this thesis and offers an important contribution that traditional methods may not have easily allowed. At its very core is the notion that people do not live in isolated worlds and that our interconnectedness brings a rich set of considerations into play. Lead users are a critical part of the social fabric of the games software industry, with whom firms and other entities that share the social space have different relationships and subsequently different consequences from their interaction. In a sense, we may view this entire thesis to be about social networking, as the various relationships in the industry are unpicked and examined using extant theory.

Social network analysis gives us "a powerful way to holistically understand the complex resource flows and dependencies that create performance differences" (Venkatraman and Lee, 2004) and enables researchers to derive explanatory variables relating to the structure of collaboration between social entities, even down to the level of the individual contributor. The richness of these techniques allows us to evaluate the impact of creators' connections to one another as a result of their affiliations and the resultant patterns of these connections, which a traditional or a boundaried firm-level analysis may not reveal.

Centrality of position conveys a sense of legitimacy, stability, and the reduction of uncertainty (Oliver, 1990). Preferential attachment to central members is thought to promote a *Matthew effect*[23], whereby central actors grow more central and embedded in networks over time (Barabasi & Bonabeau, 2003). Central actors are also thought to have better access to resources, including knowledge, and scholars have already demonstrated how the study of centrality of position alone has enabled insights into areas as diverse as individual influence (Brass, 1984; Krackhardt, 1992), individual performance (Ahuja, Galleta & Carley, 2003; Mehra, Kilduff & Brass, 2001; Sparrowe, Liden, Wayne & Kraimer, 2001; Baldwin, Bedell & Johnson, 1997),

---

[23] Unto every one that hath shall be given, and he shall have abundance; but from him that hath not shall be taken away even that which he hath" (Matthew 25:29)

organizational change (Hannan, Pólos & Carroll, 2003), corporate networks (Bearden et al., 1975), boundary-spanning (Pappas, 2004), innovation (Powell, Koput & Smith-Doerr, 1996; Tsai, 2001) and organizational performance (Tsai, 2001). Network analysis contends that the structure of social relations determines the content of those relations (Mizruchi, 1994) and centrality generally is taken to mean "network position-conferred advantage" (Cook and Whitmeyer, 1992).

Not all measures of centrality are alike. Bavelas' work (1948) marks the beginning of formal discussions on centrality in the literature. To measure centrality, researchers traditionally choose from degree, closeness, and betweenness centrality, or use the measures of Bonacich (1987) that accord power and bargaining position to centrality, and it is not unusual for a study to employ more than a single measure of centrality (Krackhardt, 1992). Comparisons of centrality measures are articulated by Freeman (1979) and those measures specifically applied in this thesis are explained in greater detail in the methods section.

Context is extremely important to any application of social network principles. First, environments like games software, in which connections and *whom you know* proves to be of critical importance, can especially benefit from this type of analysis. Second, because social network analysis allows us to study the structure of connections and positions down to the level of the individual creator, it gives us a considerable advantage in project-based and non-traditional firm environments in which team members access each other's knowledge across fluid and changing boundaries. Lead users' preferential attachment to reputable members of a network and any homophily stemming from real or perceived similarities (McPherson & Smith-Lovin, 1987; McPherson et al., 2001) may extend to firms and to individual creators of products in some industries or markets.

Because the perception of innovativeness has something to do with independence, and independence in perhaps its truest form is traditionally thought of as a somewhat peripheral or outlier social position, the particular measure of centrality I posit is significant to innovativeness in games software is not Degree Centrality, that measures the number of ties belonging to an entity, but Betweenness Centrality, which looks at ties in the sense of how an entity is positioned as an intermediary in a network. In other words, I argue that games in which lead users have greater continuing interest will be those that have been able to effectively combine the know-how from producers skilled at commercial success (and therefore having high Degree Centrality) with pure creativity (an outlier position). In other words Betweeness Centrality may indicate innovative products that have realized considerable economic value from their inventions. I will cover actual measures in greater detail in the next chapter, but for the moment make these remarks to observe the compatibility between H1 and H2, which is below:

H2: *The Betweenness centrality of a product's creators will be significant and positively related to lead user interest in the product.*

Whether users can ascertain the extent to which a producer is an intermediary between mainstream and highly innovative, peripheral producers is contextual to industry, but also reliant upon users' knowledge acquisition and utilization processes, which for lead users, are well-recorded in the literature. We already know there are marked differences in knowledge acquisition between users who are innovators and those who are non-innovators. The amount of information thought to be pertinent, sources used to acquire knowledge, style of processing, and the resultant expertise in terms of performance of product-related tasks and product-category expertise all differ between the two user groups (Gatignon & Robertson, 1991; Alba, Hutchinson, & Lynch, 1991).

Specifically, lead users may not be wholly rational. As innovators, they tend to rely on decision heuristics and abstract levels of categorization and memory; Their category structures are less stereotypical and they rely less on observation, planning, and deliberation, compared to non-innovators; Their searches are more efficient (Johnson & Russo, 1984) and since they are not influenced by the adoption of others (Bass, 1969) innovators tend to rely on their own prior knowledge (Cohen & Levinthal, 1990) and inferences from that knowledge as well as more impersonal sources, such as external information networks (Rogers, 1983). Trustworthiness of the source of information matters a great deal due to the uncertainty of product quality, which is generally an issue in cultural industries (Kretschmer, Klimis, & Choi, 1999; Lampel, Lant, & Shamsie, 2000), so these information networks probably comprise of other known innovators.

It is not a new assumption that supply chain design decisions, which result in assigning responsibility to various entities in order to get a product developed and commercially launched become market signals (Krishnan and Ulrich, 2001), so I make the case that this phenomenon is applicable to games software, in which lead users take pride in accumulating intricate, insider-type of details relating to the product and its creators. Their deep knowledge of the industry enables them to hold an almost portfolio type of view of game creation that is somewhat akin, although to much less of a degree, to the film industry. In other words, hardcore gamers' interest in game products are a complex mix of available signals, heuristics, and personal knowledge, that likely includes information on the games' creators.

4.4   Development of Hypothesis III and IV: The Product Family as an Exploitative Model

Since we cannot expect lead user theory to be applied successfully across all circumstances, understanding the limitations of ascribing importance to lead users is an important step, especially for those businesses operating in environments dominated by these

users. Probably the literature's most powerful glimpse of where these limits may lie is in the assumption of scholars such as Lynn, Morone, & Paulson (1996), Veryzer (1998), von Hippel (2005), and Lüthje and Herstatt (2004) who make a strong case for the integration of different customers, depending what type of innovation a firm pursues for its product strategy. Following the lead of these scholars, I argue that a useful construct to help us distinguish the benefits and the pitfalls of partnering with lead users is that of exploration-exploitation (March, 1991).

On one hand, it has been argued that "the richest understanding of new product and service needs" are held by lead users (Herstatt & von Hippel, 1992), and many firms today are actively involving lead users to strengthen their innovation processes (Jeppesen & Frederikson, 2005). Studies in Open Source Software have illustrated the magnitude of a user-based innovation effort, by documenting its dominance over products from well-established, successful firms that include Microsoft and Netscape (Lakhani & von Hippel, 2000). On the other hand, as noted earlier, the effort required by organizations to elicit positive word-of-mouth from these users, engage them, and access the required information from them before integrating it into the organization can be considerable (von Hippel, 2001, 2005; Jeppesen & Molin, 2003; Magnusson, 2003; Jeppesen, 2005; Shah, 2005; Lüthje, Herstatt & von Hippel, 2002, 2005), so producers need to understand not just how but when and if they should partner with lead users. In addition to von Hippel's work, Lüthje and Herstatt (2004) have completed a review of literature and theoretical foundations of the Lead User method, for those readers with interest in acquiring even deeper knowledge in this area.

Since we have strong evidence regarding the failure of conventional marketing techniques in managing unconventional or radical innovation (Utterback, 1994), and lead users are able to predict important market trends (von Hippel, 2005), we have accepted that at least in the context of explorative (March, 1991) or more radical innovation (Utterback, 1994) in many

industries, firms should follow, support, and pay close attention to this group of users. For instance, Lynn, Morone and Paulson (1996) found in their study that conventional marketing techniques applied to radical product development were of limited utility and oftentimes inaccurate. Additionally, Veryzer (1998) argues that once a product application is identified, marketing is able to provide direction and input on design and development, but the average customer lacks the appropriate frame of reference to evaluate discontinuous products.

However, the role, if any, for lead users in the context of innovation related to sustaining technologies (Christensen, 1997) or exploitation (March, 1991) and their involvement in feedback loops, whether inadvertent or purposeful, is as yet unclear in the literature. We can, however, agree that since lead users are ahead of the market on important trends, they should technically face no cognitive hurdles such as conceptualization and familiarity with exploitative products[24], which von Hippel (1986) has argued constrains the average user from being able to problem-solve and provide accurate data, at least in the case of explorative innovation. It should follow then, that lead users' opinions on exploitative innovation should be at least as good as, if not better than the average user.

However, there appears to be a lack of empirical evidence concerning the role of lead users and the value of their guidance with products that rely upon existing knowledge and incremental innovation, which as Gomory (1989) and Florida and Kenney(1990) have argued, forms the basis of sustaining profits and leadership positions. In fact, although attention is repeatedly drawn by scholars to the lead user project team that developed 5 major new product lines at 3M and the non-lead user team developed 1 instead (Lilien et al., 2002); nobody seems to be particularly taken by the fact that the lead user team developed no incremental product

---

[24] March (1991) contrasts "the exploration of new possibilities" and "the exploitation of old certainties" so I offer that exploitative products in games software are non-original games that build on licenses, or existing product families, or extend existing social concepts.

improvements, while the non-lead user team developed 41 of these. It is true that the lead user inventions were estimated as 8 times more valuable in terms of projected sales, but if incremental innovation is so important, this point may very well be worthy of academic inquiry.

In particular, we have not empirically examined whether there are circumstances under which we should ignore the opinion of lead users, or at least treat their opinions with a great deal of caution. My work supports earlier views that different customers should be integrated into strategy, depending on the type of innovation undertaken, and I further argue that the circumstances in which companies are prone to being led astray by following lead users may have something to do with exploitation. Further, a proximation of an exploitative model in the product development world lies in the notion of product families.

A *brand franchise* in the computer and video games software industry represents a series of games in a product family, that results from expansion of an original property and replication of core business ideas, through sequels and other follow-on products or licenses of existing social concepts from within or outside the industry. From the average consumer's perspective, franchises allow beneficial cognitive categorization. This grouping, that draws upon elements of popular culture, branding, and the familiar has been referred to in the literature as symbolicity, that has been linked to theatrical success in the film industry (Hennig-Thurau, Walsh, and Wruck, 2001). The consumer behavior literature covers these potential benefits in great detail, including the use of heuristics (Bettman et al., 1991), and for motion pictures, whether a film is a sequel has been linked to success in terms of box office and video revenues (Ravid, 1999). As an important exploitative business model, the product family can be examined to assess how critical sources of knowledge belonging to lead users and producers impact its performance.

First, we have to assume the importance of the firm's access to prior knowledge or past experience with the brand franchise to future success with exploitative business ventures, for at

least the reasons articulated by Cohen and Levinthal (1990) in their discussion of absorptive capacity. In fact, the reliance upon past know-how and learning is quite explicit and deliberate under the product family model, even to the point of codification if a license or other contract is at the basis of bringing products to market. Meyer and Utterback (1992) warn that core capabilities cannot be developed from a product family approach if "key individuals do not have the chance to work together in a concentrated way for extended amounts of time" and that momentum is created if firms can "keep the heart of a multifunctional design team together for at least a generation of a product family".

Second, given the ongoing quest for more stable sources of rents (Schumpeter, 1934; Williams, 1994), we should expect management will attempt to exploit a known source of rents by proximating the behavior (or business formula) that is believed to have contributed to success (Nelson & Winter, 1982; Szulanski, 2000). This point of view assumes that in doing so, management will incur reasonable costs, engage in rational action, and that it holds an opinion on the Arrow core[25] (Winter & Szulanski, 2001).

To that end, there are conceptual similarities and links between the strategy underlying a product family and theories on replication and on standardization. By standardizing the core product development elements and repeating the business formula believed to have been responsible for previous success, management attempts to seize known economies to acquire rents and build up relevant process experience and associated assets for competitive advantage (Markides & Williamson, 1994). The most striking benefits of a product family approach lie in economies such as the sharing of assets (Halman, Hofer, & van Vuuren, 2003), including knowledge, across products; lower costs; and a shorter time-to-market. If firms are investing in remembering what they know (Argote, Beckman & Epple, 1990) and building on that knowledge

---

[25] Winter and Szulanksi(2001) use the term *Arrow core* to refer to "the knowledge of which attributes are replicable and worth replicating, together with the knowledge of *how* these attributes are created".

(Cohen & Levinthal, 1990), this type of organizational learning can become a source of appropriability and sustainability of rents. The resource-based view corroborates this, in its assertion that competitive advantage lies in hard-to-duplicate knowledge resources (Barney, 1991; Grant, 1996).

The literature posits that at least for consumer markets that feature fast product cycle environments; technological leadership and "spinning out of models leads to success" (Sanderson & Uzumeri, 1995). In addition, Meyer and Utterback (1992) argue that from product family strategies we are able to assess firms' core capabilities. To the extent a firm leverages and replicates difficult-to-imitate knowledge assets, it will be at a competitive advantage (Argote & Ingram, 2000; Eisenhardt & Martin, 2000; Teece et al., 1997; Zander & Kogut, 1995; Winter and Szulanski, 2001). Teece (1998) offers that "replication and transfer are often impossible absent the transfer of people", and this reliance on human capital is generally accepted in the literature to be greater with a higher prevalence of tacit knowledge.

The tacit dimension is worth exploring because we know that there is compelling evidence that replication itself can only be approximate (Baden-Fuller & Winter, 2005), and it is largely for this reason that except for the most deviant of departures from compliance, franchisors have found that franchise contracts are legally quite unenforceable (Caves & Murphy, 1976; Bradach, 1997, 1998; Winter & Szulanski, 2001). Even for the most stringent contracts, localization and other deliberate changes to accommodate different contexts, including different consumer preferences and needs is not at all unusual (Douglas & Wind,1987; Bartlett & Ghoshal, 1988; Kashani, 1989; Lemak & Aruthanes, 1997), and this can only occur with interception by human capital. Additionally, since we have an appreciation of how difficult it is to replicate (Winter & Szulanski, 2001; Szulanski & Winter, 2002), especially in the face of

tacit (Nonaka & Takeuchi, 1995) and sticky (Szulanski, 1996) knowledge, it should follow that the role of human capital in the process, should be considerable (Teece, 1999).

I argue that to successfully extract value from or exploit business opportunities, we should employ knowledge-based resources previously employed successfully in similar contexts. Social entities that are central in a network of high-performing (games) products by virtue of having a high quantity of connections (i.e. collaboration) in that environment should be in a position to know what routines and skills tend to result in success, from having both repeated experience with success and also numerous connections to other successful game creators.

Assuming there are standards or a formula for commercial success in games software, having highly central creators in this sense should be an indication not only of influence, but also whether the appropriate standards or formula for success has been available to them during the creation of a game. To the extent current technologies are sustained (Christensen, 1997) these game creators will likely play a role in setting future standards for success and since a product-family approach tends to introduce more products in a shorter timeframe, we should expect that a network of high performers will contain both multiple occurrences of products from successful product families and repeated appearances of the key creators that have developed these products, over some reasonable period of time. For these reasons, creators who are highly central as a result of having numerous connections should place the games they develop in advantageous positions, and these games should make a powerful contribution to exploitation.

In terms of operationalization of these ideas, I make two inter-related arguments:

1. Degree Centrality, which should be important to success with highly commercialized products and exploitation, while lead user interest should be positively and significantly related to Betweeness Centrality (i.e. H2). The different measures of centrality focus on different approaches by producers to the marketplace and should translate into different

human capital (and by extension, skills) requirements. Specifically, a) Products whose creators are highly-connected in the social network of high performers by virtue of the *quantity* or number of their connections, should be uniquely positioned to extract value from product family strategies; b) Products whose creators are centrally placed in the social network of high performers as a result of influential, intermediary, and unique positions, or the *quality* rather than the quantity of connections they have are more likely to be significant to driving lead user interest. In other words, the basis for calculating centrality of a product's creators is an important theoretical consideration, which indicates different human capital and skills needs for producers.

H3: The human capital (or skills) requirements for driving lead user interest, are different from those that are significant to developing successful product families.

2. Because we should expect that exploitative product strategies are more focused on economic returns and mass marketing rather than artistic value or innovation in the explorative sense, lead users are not likely to be interested in products they perceive as being part of such a strategy. We have already noted that hardcore gamers are predisposed to products that are thought to mirror their identity as unique, creative entities, so product family strategies that are heavily based on exploitation (i.e. mainstream, highly commercialized, sequelized products, and reuse of concepts) and products deeply entrenched in such a model are not likely to be of continuing interest to these users. For these reasons, I expect that lead user interest will have a significant, inverse relationship with products perceived as exploitative and the number of follow-on products in its product family are an indicator of this, in the context of my own study. Formally,

H4: Lead user interest in a product will have a significant and inverse relationship with the number of follow-on products from its family.

On one hand, the importance of hardcore gamers to the games software industry cannot be denied. As consumers who urge producers towards making greater creative contributions and higher quality products, and as creators of value themselves, hardcore gamers have much to contribute, and play a critical role in the games software value chain. In this chapter, I have argued that these lead users of the games software industry are strongly influenced by identity considerations, so we should expect them to be attracted to products they perceive as innovative. In this regard, I expect that factors relating to the product in a direct sense such as the product's originality, the antithesis of which may be thought of as exploitation, and more indirect factors such as the reputation and social positioning of the product's creators as innovative, unique, influential entities play a significant role in determining lead users' interest. Independence is akin to innovativeness in at least one other industry, that being motion pictures, and centrality has already been used extensively in the literature.

On the other hand, in hypotheses III and IV lies promising direction for empirical study and future contribution in terms of work beyond this thesis. These ideas are grounded in emerging theory, and potentially also inform the ongoing exploitation-exploration debate. After first establishing the importance of understanding the drivers of lead users' interest, I examine what is perhaps the inverse of this notion next: I argue that we cannot claim lead users are universally important to management strategy and that ultimately, a firm's innovation strategy should dictate whether lead users are ascribed importance, and at what level.

CHAPTER V METHODOLOGY

My methods have been chosen with care and mindfulness of the context as well as the data, and have included regression, social network analysis, and case analysis.   Over 40 firms in the games industry have contributed to my dataset by offering valuable primary data including extensive personal interviews and sensitive company and competitive information, in addition to secondary data sources, so surely any richness in my analyses and discussions stem in great part from these sources.

The most pertinent of these organizations are noted in Exhibit V-a below.

Exhibit V-a: Major Sources of Data[26]

o Activision	o Gamasutra	o Mobygames
o Apple Computer	o Game Developer Magazine	o PC Data
o Amaze Entertainment	o Gamespot	o Pokémon-USA
o BioWare Corp	o Gamespot Traxx	o Nintendo
o Black Lantern Studios	o G4 TV	o Nihilistic Software
o Buena Vista	o ICM	o NPD Funworld
o Bungie Studios	o id software	o Sammy Corporation
o Destineer Studios	o IDG Entertainment	o Sony Corporation
o DFC Intelligence	o IGDA	o THQ
o Eidos	o IGN	o Totally Games
o Electronic Arts	o Next Generation	o Turbine Entertainment
o The ESA	o LucasArts	
o Firaxis	o Microsoft	

---

[26] These sources are an incomplete list and do not include participants with whom I had what I regarded as overly brief meetings and sources such as investor relations, media reports, information contained within games or in game packaging and from other public sources.

It is my hope that the difficulty and complexity of the data compilation process promises unique and valuable intellectual property, and that the richness of the data offers vast theoretical and practical paths beyond my doctoral studies.

5.1 Methods & Design

To test my hypotheses, I employ empirical methods using variables relating to a set of products (games) that were identified as commercial high-performers over a 6-year period to investigate the determinants of lead user (hardcore gamer) interest. My dataset has been constructed using a combination of publicly available and proprietary information over a 6-year period for the 20 top selling titles in the Console/Video Game (VG) and in the Personal Computer Game (PC) markets (n = 120), as measured in 1998-2003 annual units sold. As readers are able to confirm from the industry analysis presented in Chapter II, this particular period of time is one of relative stability in the industry, especially for hardware. Sony led the market with a backward compatibility strategy and the market for hardware remained somewhat predictable over this 6-year period. For these reasons, the study of the software market during this period was of particular interest.

Because sales is such an important determinant of success in the games industry, and it is widely acknowledged as possessing the capacity to influence the survival and demise of entire developer and publisher firms, I assume the published top-selling titles, based on tracking of annual units sold by the NPD Group/NPD FunWorld® and PC Data (part of the NPD Group since March 2001), are accepted by the US interactive entertainment industry as its highest commercial performers, for a particular year. While there are debates on the accuracy of the actual numbers based on point-of-sale data reported by NPD, and firms use various multipliers

and adjustments to compensate for the NPD tracking method and its exclusions[27], there is little debate about the annual rankings that NPD publicly reports for titles, so I have relied upon these ranks to identify the titles to include in my sample. All rankings and ratings used have been generated by sources entirely independent to this study, and have been chosen carefully, for their validity, acceptance, and wherever possible, their widespread use within industry.

In addition to more traditional variables expected in regression analysis, I derived variables from an extensive 4600-node social network study of the game software industry. Supporting this thesis' qualitative and quantitative analyses are extensive personal interviews and data collection from over 40 firms in the games industry. Due to space and relevance considerations, I do not present any findings from the social network analysis other than those relating to centrality in this thesis.

5.2 Variables

This section describes the variables used in the statistical analysis, beginning with the dependent variable, followed by the independent variables and the controls.

5.2a The Dependent Variable: INTEREST

The lead user INTEREST of each title in the sample was estimated over a 24-hour period at the end of December 2004, from online *hits* measured by Gamespot.com and ©Gamespot Trax, as a result of the user interest the game generated. Hits, in this case, are *information requests*, which were tallied based on the number of times visitors accessed or requested information directly related to the game, such as reviews, screenshots, demonstrations, cheats, and other game-specific downloads or information. The bulk of software sales are conducted in the final or "golden" quarter, and given that many gamers would be at home with more leisure

---

[27] The most notably cited of these has become the exclusion of Walmart as a channel, and the user base of Apple/Macintosh. (http://www.npd.com/press/releases/press_010316.htm)

time available due to the holidays, I expected online gamer activity at the end of December would be high. Finally, the timing just prior to the commencement of the year 2005 was orchestrated so that INTEREST would be measured at least a year after any of the titles in my dataset had launched.

Before deciding to use the data collected in December 2004, user INTEREST, calculated from aggregated user activity was collected at 2 separate points in time, some 60 days apart, for each of the 120 games in my sample. As a function of the dynamic events I anticipated, such as the changing nature of players' preferences, activities of the media, and new titles added to the database, I expected rankings to be somewhat dynamic even over the short term, so I wanted to estimate users' interests at a point in time (essentially a 24-hour period), although obtaining an estimate over a 3-year period was possible at the time through the database. Although the number of hits vastly differs between time periods, the ranking of titles appeared to be fairly stable in the short term, based on the analysis re-run approximately 60 days later. After adjusting for newly added titles, I removed only 3 titles as outliers from the dataset, for the significance of the change to their rank (< 0.15) between the two periods. Having confirmed that the remaining values did not prove to be overly dynamic, I decided to use the values for user interest from the end of December 2004, for the reasons noted earlier.

A game's INTEREST does not signal the extent to which lead users are involved in developing the game; but rather the position the game held in terms of their interest vis à vis virtually all other games, as the game software market entered the year 2005. Other studies of *salience*, from fields as diverse as political science, sociology, psychology, and communications suffer from similar time-sensitivity limitations. Because these limitations may constrain my contribution towards understanding the drivers of lead user interest in a more enduring sense, it is noted in my concluding chapter of this thesis, along with the other limitations of this study.

To account for the effect of time and recency, given the short product lifecycles in the games software industry, which may map onto user interest scores, I also attempted to introduce lag, by indicator coding to create 6 dummy variables, for the title's year of launch (i.e. 2002, 2001, 2000, 1999, 1998, and launch prior to 1997), holding t-1 (i.e. 2003) as the referent category.

Gamespot is the most popular of gamer websites, of the 558 sites tracked at Gamerankings.com and one that is reportedly skewed toward *hardcore* gamers. As of November 2004, Gamespot eclipsed its nearest competitor, IGN, with over 1.8 times IGN's number of hits. At the time of data collection, Gamespot's database contained 16,416 titles, and according to Nielsen NetRatings[28] (2002), this database records a monthly reach of almost 8.1 million worldwide gamers. Gamespot Trax is a paid tracking service available to game developers and publishers. Because this user interest value is based on actual information requests and therefore, user behavior, it was less likely to contain many of the limitations considered idiosyncratic to the respondents themselves, such as memory-based (Alba et al., 1991) and processing-based (Bettman, Johnson, & Payne, 1991) limitations, so I preferred to use it over user-solicited ratings.

The INTEREST value is technically a ranking, based on the number of information requests generated for each game, vis à vis the 16,415 other titles that are contained in the database, under the control of CNET Networks. Due to the presence of other titles in the database, I make the case that ranks for the 120 titles in the sample are separated from one another by naturally occurring weightings, so I treat them as interest *values*. INTEREST is treated as a quantitative/metric and linear variable in my analysis, and the literature allows for this (Anderson, 1961; Labovitz, 1967, 1970; Johnson & Creech, 1983; Cooper & Emory, 1995;

---

[28] www.nielsen-netratings.com

Hair, Anderson, Tatham, & Black, 1998). Naturally occurring values of INTEREST have been

reordered for the intuitive appeal of readers, which I refer to as *Data Prep* in Exhibit V-b that

follows, so that higher values indicate greater user interest. In other words, since these original

values represented higher interest at lower numbers, they were reordered prior to regressing, for

ease of readability and interpretation of OLS results, so that higher numbers could represent

higher user interest and positive coefficients represent a beneficial impact to INTEREST, rather

than vice versa.

Exhibit V-b: Generation of User Interest Score
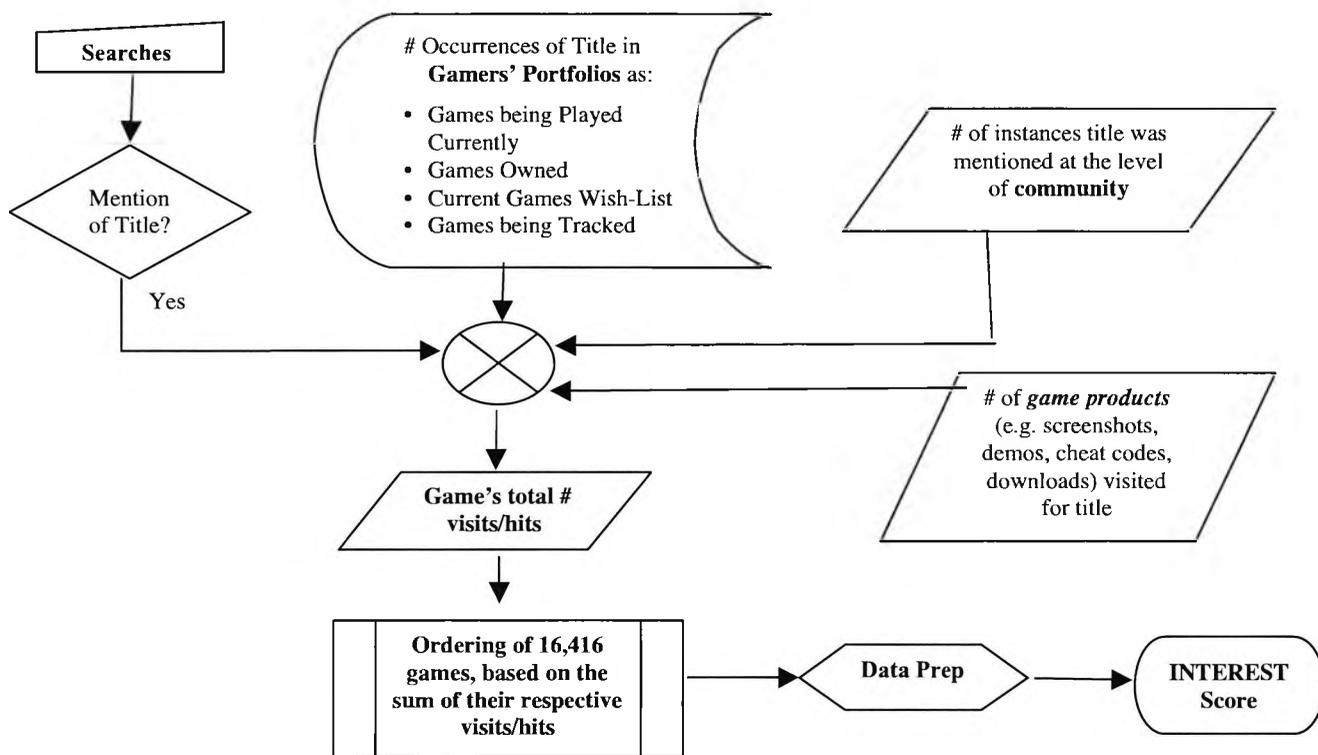
Sources: Gamespot.com, CNET

5.2b Independent Variables

i) **Reputation:** To test H1, a dummy variable (INDPNDNT) was created to indicate

whether a game was created by producers who are perceived as independent by users,

and producers in my estimation could be firms and/or individual creators. Prior to coding, I inspected public records on each participating firm, including internal and 3rd party generated media releases and stories, online resources, and financial reports/outlooks, as well as information pertaining to individual creators. Two separate industry experts were also consulted on the coding for reputation, and agreement on the actual coding for *independence* between the three of us was at 100 percent.

Because the game software industry is largely perceived as representing two types of strategic groupings, those engaged in mainstream game development and those engaged in independent (*indie*) development, I chose to conduct this analysis at the level of a single dummy variable. Those firms classified as independents were coded "1" and others were coded "0" using this method.

The actual basis for this coding was discussed in detail in my development of the first hypothesis. That is, we had coded games as independent based on *perceived innovativeness* or creative freedom of the various creators (i.e. the *quasi* organization) behind the game, rather than purely by factual, financial backing although all the games we coded "1" did have at least one major creator that had entered games software using the *indie* financial model. A debrief following the coding revealed that raters' logic for the coding was consistent, with all raters citing the high number of mergers and acquisitions as being responsible for their approach when they deviated from the traditional interpretation of an independent firm. To lend an appreciation for this coding at the reputational rather than factual level, *Halo* was coded as having an independent creator for the period of the study although Microsoft acquired Bungie.

Hardcore gamers' preference for the new and less-established and the strength of their identity considerations should present via a preference for products from more

maverick or innovative producers, be those individuals or firms. In a sense, INDPNDNT may also be considered a proxy for the extent to which a game is considered a collectible. Applying the lessons from the history of the Hollywood studios and the role of independent films, with H1, I expect games created by producers perceived as independent should be of significantly greater interest to lead users, compared to games from producers perceived as more commercialized or mainstream.

ii) **Centrality:** To test H2 and H3, I used an extensive social network analysis of over 4600 nodes, representing individual game creators, non-directionally linked as a result of their affiliation to top games over the 6-year period of the study.

The network was constructed by taking the ending credits for each title in the sample, and creating a dichotomous, two-mode, Actor x Game matrix. A valued, one-mode Game x Game matrix was derived from this information, with each cell representing the number of actors/game creators two titles have in common.

Since I am interested in examining the effect of game creators in critical positions on the INTEREST of a game and also have a need to test H3 in this thesis, I calculated two different centrality measures utilizing standard Ucinet 6 for Windows procedures (Borgatti, Everett, & Freeman, 2002) from non-directed ties so that I could assess the effect of both *quantity* and *quality* of creators' connections. In his study of strong, directed ties, Krackhardt (1992) employs these two measures. Although Bonacich's power centrality measure described in his 1987 paper is intuitively appealing, it is an extremely robust measure that I could not justify using as a proxy for purely the quality or the quantity of connections in support of my theory, as it contains elements of both aspects, which are described next.

a) **Degree Centrality**(CENT_QNTY) for each title assesses the *quantity* of the connections between games as a result of the ties between their creators. Degree centrality defines actors that are the most active, as a result of having the most *number* of ties to other actors in the network (Wasserman & Faust, 1994). In other words, vertices occupy a central position as a result of having the greatest number of neighbors. This is a measure especially sensitive to the local dominance of points, that examines how well-connected the nodes are in their local environment (Scott, 1991). Karamanos (2003) offers that "prominence in a network is measured as a centrality concept that captures the extent of an actor's ties" and Marsden (1990) remarks that "degree-based" or network size-based measures, "focus on levels of communication". I expect that Degree Centrality will have an inverse relationship with INTEREST.

b) **Betweenness Centrality** (CENT_QLTY) assesses the *quality* of connections between games, based on the ties between their creators. It takes into consideration the fact that interactions between two non-adjacent actors might depend on the other actors in the set of actors, especially the actors who lie on the paths between the two (Wasserman & Faust, 1994). These other actors, by lying between and on the geodesics[29] of other actors, have more interpersonal influence (Freeman, 1979) and could exercise some control over the interactions of non-adjacent actors by playing an intermediary role such as broker, or gatekeeper (Scott, 1991). In knowledge terms, this could be an indication of unique or high-quality skills, potentially implying reuse across

---

[29] From *geodesy*, the science of measuring the shape and size of the earth. A geodesic was originally defined as the shortest route between two points on the surface of the earth, or in social network terms, the shortest local path between points in social space.

even seemingly unrelated products, or unique routines as the skills of individual actors come together in influential or unusual configurations. Betweenness is "an indication of the nonredundancy of the source of information. To the extent that a person is connected to otherwise disconnected parts of the network, and therefore has access to different, nonrendundant sources of information, that person will have a high betweenness score." (Krackhardt, 1992). Marsden (1990) points out that betweenness stresses "control, or the capacity to interrupt communication". Bolland (1988) has found that betweenness[30] is the least redundant of the centrality measures and all of them are positively correlated. I expect that Betweenness Centrality will have a positive and significant relationship with INTEREST.

iii) **Products in Family** (FAMPRODS): To test H4, I created a variable FAMPRODS, that codes the number of products that were launched in a product's family, since its own release. This number which was a simple count of all follow-on products in the family, including cross-platform releases, add-on packs (which are also referred to as expansion packs in games software), multi-lingual releases, and true sequels up to the conclusion of the study in 2004, since the dataset actually spans the time period from 1998-2003.

I reasoned that a strong indicator of how users might perceive exploitation by a product would be to look at the stream of products it potentially facilitated within the bounds of its product family. This may also be construed as one dimension

---

[30] Bolland examines Degree, Betweenness, Closeness, and Power Centrality.

relating to the success of the product family, since we could argue that for a product family to remain in existence, each product extension must either materially contribute to the success of the product family directly, by being successful in its own right, or at least it must not detract from the product-family's success by failing and diluting the brand. One could say that the very existence of sequels in industries such as film and video games generally implies past successful performance on some dimension, of which sales is only one. It is the normal course of business in Hollywood that word of a motion picture's success sparks conversations about, and plans for a sequel, to take advantage of the film's *salience* to audiences and to capitalize on the momentum created by its success. However, I also recognize that a dimension of success other than sales may also drive a firm to continue extending the product family. Few would argue that the financial success of Eidos' Tomb Raider lay in the marketability of its primary character, Lara Croft, who ultimately made it possible for the game franchise to reverse the typical model of film-to-game franchises and gain entry into the world of film-making. Worth noting is that products from families have been especially strong in the period of the study, garnering about three-quarters of the titles across the 6 years.

I expect that lead users will not be interested in products perceived to be a part of a heavily exploitative strategy, focusing on mass marketing and economic return; rather than innovation, for which parallel notions in the games industry are original content, artistry, and creativity. Exploitation here might mean many follow-on products, and reuse of concepts that is in conflict with lead users' identity as unique, innovative entities, so I expect an inverse relationship between INTEREST and FAMPRODS.

Exhibit V-c: Control Variables for Y = INTEREST

Variable Name	Type and Description	Source	Predicted Relationship
YOL_97 – 02	Dummy variables. Year of launch variables to account for year of title's release. Note: YOL_97 accounts for titles released prior to, and including 1997. Referent is the year 2003.	Product characteristics were cross-referenced using gamespot.com, ign.com, mobygames.com, nintendo.com, igda.com, theesa.com and gamerankings.com	**Inverse.** Compared to games launched in 2003, games from earlier years will have less INTEREST to gamers.
PLATFORM	Dummy variable to account for platform. Referent is Personal Computer (PC) games. Handheld games are included as video/console games.	Ibid.	**Positive.** Video games are of greater INTEREST than PC games.
RPT_PERF	Proxy for iterative sales performance, which should signal superior retail relevance longevity. Value is the number of times a game has appeared on NPD's top annual sales list, from 1998-2003.	Sales rank information from market research firms NPD and PC Data.	**Positive.** Interest should be higher for titles of greater popularity/ relevance longevity.
GAMEQLTY	Quality rating 0-10, as assessed by the media/ interactive entertainment press. Some ratings required conversion to a 10-point scale, on which higher ratings denote better quality. For the sample, there is high correlation with reviewer ratings from Gamespot.com (0.859) and IGN.com (0.816), the 2 most popular game websites based on hits, according to GameRankings.com	Multiple sources including Metacritic, IGN, Gamespot, and Game Rankings. Restricted to press reviews released during the year of game launch.	**Positive.** Higher quality games, as assessed by the media, should be of greater INTEREST to gamers.
GENRE	Dummy variable that codes 1 for genres that are considered more popular with mainstream audiences. These include Action, Racing/Driving and Sport; in contrast to the referent category of RPG, Strategy and Simulation, Adventure, and Miscellaneous (e.g. hybrids).	Ibid.	**Inverse.** Hardcore gamers are not interested in mainstream genres.
DIFICLTY	Difficulty rating as assessed by professional game reviewers.	Gamespot.com	**Positive.** Hardcore gamers' interest should grow with a game's difficulty.

5.2c   Controls

Control variables utilized in the first analysis are listed in Exhibit V-c, alongside definitions of how they are measured, their sources, as well as their predicted relationships with the dependent variable, INTEREST.

i) **Year of Launch (YOL)** – YOL is the year in which the game was commercially launched. Using 2003 as the referent category and assuming that games that launched in 1997 or before may be assigned a single value (YOL_97), I created 6 dummy variables for this analysis. For the interaction of Year of Launch (YOL) and reputation (INDPNDNT), I coded the years of the study from 0-10, so that higher numbers represent earlier years, starting with the value of zero assigned to 2004, the time of the data collection, and extending to 1994, the year of Myst's launch. The recency effect in the games software industry is expected to be quite significant, so *ceteris paribus*, games that are more recent or have launched in later years should be more interesting in December 2004 to hardcore gamers. The relationship between YOL and the dependent variable, INTEREST, is therefore expected to be an *inverse* one. The INTEREST of games in the study from years other than the referent, which is 2003, should also show negative values.

ii) **Platform (PLATFORM)** – This is a dummy variable created in order to separate the sample between PC games and video games. I group console and portable titles into a single category entitled *video games*, which is consistent with the approach market research leader NPD takes in its reporting to the interactive entertainment industry. Note that to check robustness I also completed analysis for platform at the level of individual console (e.g. XBox, Game Boy Advance, etc.) and because the results

were not considered noteworthy, I made the decision to abandon a higher level of detail and control for platform at this level of dummy variable. For PLATFORM, I assign 1=Video game platform and 0 = PC platform, and I expect the relationship to INTEREST to be *positive*: Since video games are supported by the more in-vogue platform, they should be of greater interest to hardcore gamers compared to PC games.

iii) **Repeat Performance (RPT_PERF)** – This is a proxy for repeatedly successful sales performance for which I coded games based on their iterative appearance on NPD's annual top-selling titles list, across the 6 years of the study. The actual value is the *number* of times a game appeared on NPD's list. The more impactful a game has been, by virtue of its superior sales performance and repeated appearance on the top-selling list in spite of the typical retail relevance for the industry of 45-90 days on average, the greater we should expect its memorability to be (and lead user INTEREST to be significant), so I expect the relationship of this variable to INTEREST to be a *positive* one.

iv) **Game Quality (GAMEQLTY)** – Game quality as assessed by game media. Metacritic is an industry standard for entertainment ratings which converts publicly available critic ratings into standardized scores, so I began with these scores. I cross-checked independent press ratings and those available via IGN, and Gamespot so that those ratings that were not already reflected in Metacritic would be considered. Higher quality ratings by expert reviewers should have a *positive* relationship to INTEREST. Although vehicles such as awards and critic ratings that generate opinions from professional bodies are likely to produce a similar effect (Litman,

1983; Nelson et al., 2001), unlike with film, awards are not very well established and standardized in the games industry, so they have not been included as controls.

v) Genre (GENRE) – The word genre is originally from the French word meaning "kind", "sort" or "type". Wikipedia (2006) defines genre as "a division of a particular form of art according to criteria particular to that form" and distinguishes 3 types of genre: 1) those of setting, such as westerns or science fiction; 2) those of mood, such as comedy or horror; 3) and those of format, such as musicals or non-fiction. As with nearly all varieties of genre classification, the matter of any individual computer or video game's specific genre is somewhat open to personal interpretation. Within the games software industry, there is a lack of consensus around most formal definitions, including those of genre, but some classifications are definitely more popular than others.

Gamer websites often code for genre at a high-level and also at sub-classifications but because there are widely differing interpretations at the more detailed level, I gained agreement between my sources by keeping the analysis at a more generic level. After initially coding for 7 separate genres. I then created a dummy variable for titles developed in the *more-commercial* genres of action, racing/driving, and sport, using the other *less-commercial* genres of strategy, simulation, adventure, and hybrid genres as the referent category. This approach has been taken in studies in the motion picture industry focusing on box office receipts (Hennig-Thurau, Houston, & Walsh, 2003, Stepanek, 2004).

Studies on other entertainment industries, most notably film, have shown strong relationships between commercial success in terms of box-office success, and genre

(Litman, 1983; Becker et al., 1985; Austin and Gordon, 1987). Specifically, the theory that the more commercial genres (e.g. action) will have superior commercial performance and more participation from well-known firms, stars, and such, is initially applied here. However, the more commercialized and ostentatious a game, with the backing of major firms, huge budgets, celebrities[31] and the like, the more might be its chances of becoming a top seller, but for those same reasons, I make the case that it should detract from hardcore gamers' appreciation and therefore, INTEREST. This effect should be significant as user interest is measured at a point well past its heyday, so INTEREST measures a game's performance in terms of its memorability to users and any indirect or transitory benefits from hype, celebrity involvement, etc., are less likely to be influencers, and the relationship to the dependent variable should be an *inverse* one.

vi) **Game Difficulty (DIFICLTY)** – Game difficulty is measured as rated by professional reviewers at Gamespot.com and is based on a 4-point scale on which 1=Easy and 4= Hard. I expect that the difficulty of a game will have a *positive* relationship with hardcore gamer interest because more difficult games present a challenge for these gamers, offer potentially longer hours of gameplay, and there is a lower likelihood of these users beating the game, at least in the short-term, so the game's memorability should be greater.

---

[31] Apart from roles in game creation (e.g. the Wachowski brothers' creative role in the Matrix games), celebrities contribute to games via such vehicles as endorsements and branding (e.g. John Madden, Tony Hawk, NASCAR, Tiger Woods), motion capture (e.g. Keanu Reeves), voice-overs, and the like.

CHAPTER VI   STATISTICAL STUDY FINDINGS

Following the approach of standard academic papers, my recap of the results of my study is separated from Chapter VIII, which contains in-depth discussion and implications of the findings. In that spirit, the current chapter contains the findings for the statistical part of this thesis, which more directly examines whether there is support for the hypotheses. The next chapter looks at selected case studies from the industry, to see what we may learn from an in-depth investigation of particular games and their relationship to lead users. Due to the inherent limitations in the case study method, Chapter VII cannot be used to test hypotheses as this chapter does, however, I have included it to assist readers in understanding and illuminating nuances beneath the statistical analysis and the discussion.

6.1 Findings of the Study

Exhibit VI-a contains the Descriptive Statistics and Exhibit VI-b contains the results of the OLS regression with INTEREST as the dependent variable. The descriptive statistics show that this set of top-selling games have quite a strong record of inherent interest compared to the other 16,415 games in CNET's database, as should be expected as a result of their popularity (mean = 14493; s.d. = 2063.612).

As a result of my concerns regarding outlier status and issues surrounding data collection, I permanently removed 3 games from the sample. Other than DIFICLTY, which measures a game's difficulty level and uses 116 cases, all other variables use 117 cases. The dataset was examined for multicollinearity using guidelines from Hair et al. (1998) and variables were formally validated for normal distributions using the Kolmogorov-Smirnov test. Neither of these tests indicated any cause for concern. Additionally, correlations were generally low. The

highest of these, at 0.600, is well within the bounds for this type of study. As can be verified from Exhibit VI-a, most of the other correlations were considerably lower.

PLATFORM confirms that games were divided equally between PC and video games, and all of the Year Of Launch (YOL) variables show that the games are fairly equally divided in terms of the year of commercial launch, including YOL_97 which codes for games launched in 1997 and before. The dummy variable to denote genre (GENRE) inicates a moderately well-represented mean of 0.37 between the more and less commercial genre categories and independents were fairly well represented (0.222), despite the trend towards mass marketing in the industry.

As was expected from game industry trends, I separately assessed that brand franchises were dominant (mean = 0.74), reflecting the beliefs of practitioners that three-fourths of the games are franchised or licensed titles. The mean of follow-on products in the family (FAMPRODS) of 15.00 likewise indicates that strategies based on exploiting known models were dominant. Games had, on average, made a single appearance (RPT_PERF = 1.390) on the top sales ranking list over the 6 years of the study. As one should expect for top-selling games, their quality as rated by the interactive entertainment press was high (mean = 8.426; s.d. = 1.227) and games were of moderate difficulty (mean = 2.49; s.d. = 0.974).

The Degree Centrality values show that, on average, each title has 125 connections to others, as a result of the links between the actors, and there is high variability in the dataset on this measure (s.d.= 126.156). Betweenness Centrality scores also show strong variability and indicate that on average, each title is on a single geodesic between the other games in the network. The minimum and maximum for Betweenness scores, is 0.00 and 15.808, respectively.

Exhibit VI-a: Descriptive Statistics and Correlations

	Mean	S.D.	N	Y	1	2	3	4	5	6	7
Y INTEREST	14492.94	2063.612	117	1.000							
1 YOL_97	0.110	0.316	117	-0.248**	1.000						
2 YOL_98	0.160	0.370	117	-0.199*	-0.156	1.000					
3 YOL_99	0.150	0.362	117	-0.188*	-0.151	-0.188*	1.000				
4 YOL_00	0.150	0.354	117	-0.054	-0.146	-0.182	-0.176	1.000			
5 YOL_01	0.140	0.345	117	0.167	-0.141	-0.175	-0.170	-0.164	1.000		
6 YOL_02	0.190	0.392	117	0.279**	-0.170	-0.212*	-0.205*	-0.198*	-0.192*	1.000	
7 PLATFORM	0.500	0.502	117	0.105	-0.079	0.120	-0.091	-0.069	0.053	0.048	1.000
8 RPT_PERF	1.390	0.587	117	0.195*	-0.145	-0.058	0.119	0.304**	0.073	-0.099	-0.141
9 GAMEQLTY	8.426	1.227	117	0.600**	-0.132	-0.034	0.003	0.029	0.014	0.126	0.391**
10 GENRE	0.370	0.484	117	-0.112	0.069	-0.095	-0.079	-0.163	0.058	0.087	0.450**
11 DIFICLTY	2.490	0.974	116	-0.067	0.324**	0.040	0.274**	-0.109	-0.074	-0.268**	-0.276**
12 CENT_QLTY	1.037	1.997	117	0.227*	0.091	-0.190*	-0.062	-0.072	-0.053	0.065	0.105
13 CENT_QNTY	124.436	126.156	117	0.205*	-0.222*	-0.070	-0.230*	0.255**	0.030	0.183*	-0.124
14 INDPNDNT	0.222	0.418	117	0.190*	0.204*	0.043	-0.114	-0.045	0.027	0.006	-0.324**
15 FAMPRODS	15.00	9.567	117	-0.194*	-0.148	0.129	-0.050	0.229*	0.050	-0.060	-0.016
16 YOL*INDP	1.043	2.222	117	0.085	0.399**	0.107	-0.094	-0.063	-0.053	-0.118	-0.367**

Exhibit VI-a: Descriptive Statistics and Correlations (contd.)

	8	9	10	11	12	13	14	15	16
Y INTEREST									
1 YOL_97									
2 YOL_98									
3 YOL_99									
4 YOL_00									
5 YOL_01									
6 YOL_02									
7 PLATFORM									
8 RPT_PERF	1.000								
9 GAMEQLTY	0.211*	1.000							
10 GENRE	-0.240**	-0.019	1.000						
11 DIFICLTY	0.021	-0.108	0.090	1.000					
12 CENT_QLTY	-0.173	-0.021	0.237**	0.029	1.000				
13 CENT_QNTY	0.225*	0.107	-0.333**	-0.361**	0.050	1.000			
14 INDPNDNT	-0.078	0.070	-0.109	0.405**	-0.150	-0.150	1.000		
15 FAMPRODS	0.369**	-0.018	-0.086	-0.198	-0.196	0.446**	-0.347**	1.000	
16 YOL*INDP	-0.132	0.023	-0.151	0.502**	-0.161	-0.204*	0.882**	-0.282*	1.000

* Signif. at the 0.05 level (2-tailed).
** Signif. at 0.01 level (2-tailed).

The control variables were added across Models 1 and 2, resulting in strong R-Square values at 0.332 for Model 1 and 0.652 for Model 2 of the study. R-Square is an overall measure of the strength of the association, and shows the proportion of variance in the dependent variable that can be predicted from the other variables in the model. Model 2 added several product characteristics that are considered important differentiators between hardcore gamers and the rest of the market, so that I could simultaneously test for high representation of lead users in the study. The results of Model 2 confirm this, by showing not just a *recency effect* from the significance of the YOL variables; but a user group whose interest rises with the game's difficulty level and game quality, as assessed by expert reviewers; who prefers original rather than franchised titles, as well as less mainstream genres. The *recency effect*, widely discussed in the psychological and communication literature, stems from a cognitive bias that gives disproportionate interest in recent stimuli. I argue that hardcore gamers not only prefer the latest technology and products for identity and image-related reasons, they are also bombarded by a vast amount of complex technical and market information, and given inherent limitations in users' abilities to process this information (Simon, 1955), recency is used as a heuristic to infer conclusions about a product's attractiveness (Bettman et al., 1991). General issues surrounding the information overload consumers experience today are covered by Davenport & Beck (2001).

The effect of platform (i.e. console versus PC) across all models was not significantly different from zero, which may suggest hardcore gamers are platform-agnostic. They tend to own the latest high-end hardware and are also likely to own or have owned a wide variety of older game platforms (Kim, 2001; Ip & Adams, 2002). It is worth noting that in tests of robustness the sub-platforms (e.g. XBox, Playstation2, GameCube, GameBoy, etc.) also showed no significance, justifying developer trends towards becoming platform-agnostic and EA's strategy of launching titles cross-platform, in multiple countries and languages on a single day.

Exhibit VI-b: OLS Regression results for Y = INTEREST

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
(Constant)	14641.759	7575.111	8366.176	7143.288	8182.499	8121.344
	612.12	1006.948	1043.35	991.121	1001.823	989.027
YOL_97	-2734.664***	-3458.016***	-3551.316***	-3263.138***	-3297.902***	-3175.737***
	701.595	552.519	542.668	534.974	539.231	519.41
YOL_98	-2760.161***	-3218.623***	-3366.517***	-2737.170***	-2901.351***	-2616.44***
	641.205	498.886	492.773	499.243	497.704	497.358
YOL_99	-2897.562***	-3635.331***	-3537.44***	-3319.930***	-3469.968***	-2999.492***
	659.852	516.8	507.944	511.511	505.021	497.945
YOL_00	-2559.409***	-2793.674***	-2899.949***	-2441.296***	-2521.071***	-2385.462***
	691.122	516.625	508.085	504.236	511.026	491.424
YOL_01	-1137.979*	-1275.444**	-1437.897***	-914.006*	-1094.828**	-933.18*
	672.321	497.487	492.265	487.132	487.147	474.384
YOL_02	-556.133	-837.82*	-972.772**	-573.501	-726.553	-654.689
	620.806	456.286	450.679	442.872	444.547	427.053
PLATFORM	408.756	266.679	536.37	154.895	224.853	424.551
	325.987	331.47	344.776	319.023	321.951	325.64
RPT_PERF	1081.863***	494.343**	610.015***	558.795**	705.829***	781.964***
	300.717	229.973	230.685	222.706	236.12	223.426
GAMEQLTY		857.401***	758.473***	878.505***	824.781***	752.103***
		116.725	121.994	111.743	113.87	113.973
GENRE		-1050.107***	-1053.343***	-1184.797***	-977.37***	-1057.37***
		310.649	304.278	308.003	302.558	302.393
DIFICLTY		589.671***	451.604***	526.408***	490.125***	354.35**
		152.953	161.16	150.387	152.786	153.571
INDPNDNT			818.687**			830.415**
			352.205			354.407
CENT_QLTY				212.917***		215.645***
				61.637		61.124
CENT_QNTY				-0.759		0.459
				1.098		1.174
FAMPRODS					-37.503***	-25.051*
					13.704	15.328
R2	**0.332**	**0.652**	**0.669**	**0.688**	**0.675**	**0.722**
Adjusted R2	**0.282**	**0.615**	**0.631**	**0.649**	**0.638**	**0.68**
Sig. F change	**0.000*****	**0.000*****	**0.022***[27]**	**0.004****[27]**	**0.007****[32]**	**0.001****[33]**

Coefficients, followed by their standard errors

Significance denoted by *p<0.10;   **p<0.05;   ***p<0.01

---

[32] Change considered for this value is from adding IVs to Model 2.

[33] Change considered for this value is from adding full model to Model 5 above.

Exhibit VI-c: Results of Interactions in Y = INTEREST

	Model 6	Model 7	Model 8	Model 9
(Constant)	8121.344	8651.135	8149.17	7756.051
	989.027	988.699	980.23	1004.75
YOL_97	-3175.737***	-3660.004***	-3282.893***	-3232.888***
	519.41	543.663	518.64	516.037
YOL_98	-2616.44***	-2827.118***	-2763.174***	-2531.781***
	497.358	492.753	500.516	495.654
YOL_99	-2999.492***	-3022.333***	-3135.766***	-2968.938***
	497.945	485.915	500.046	493.955
YOL_00	-2385.462***	-2480.756***	-2539.788***	-2336.307***
	491.424	481.027	495.543	488.046
YOL_01	-933.18*	-944.921**	-1101.112**	-923.433*
	474.384	462.863	480.571	470.293
YOL_02	-654.689	-608.032	-738.201*	-710.124*
	427.053	417.091	426.093	424.649
PLATFORM	424.551	621.601*	419.538	1053.206*
	325.64	327.657	322.711	497.229
RPT_PERF	781.964***	935.323***	764.431***	680.998***
	223.426	226.728	221.652	229.66
GAMEQLTY	752.103***	680.327***	759.011***	782.752***
	113.973	114.964	113.018	114.476
GENRE	-1057.37***	-1001.753***	-1078.802***	-1088.393***
	302.393	295.899	299.931	300.343
DIFICLTY	354.35**	279.484*	364.504**	339.723**
	153.571	152.893	152.302	152.489
INDPNDNT	830.415**	-427.63	-24.446	-3.724
	354.407	617.344	15.193	19.886
CENT_QLTY	215.645***	225.399***	1088.745***	940.308**
	61.124	59.768	383.286	357.49
CENT_QNTY	0.459	0.696	226.313***	202.538***
	1.174	1.15	60.903	61.103
FAMPRODS	-25.051*	-29.453*	0.612	0.125
	15.328	15.061	1.167	1.181
YOL*INDPNDNT		325.451**		
		132.302		
INDPNDNT*CENT_QLTY			-507.423*	
			301.52	
FAMPRODS*PLATFORM				-43.046*
				25.896
R2	**0.722**	**0.738**	**0.729**	**0.729**
Adjusted R2	**0.68**	**0.695**	**0.686**	**0.686**
Sig. F change	**0.001***	**0.016****	**0.096***	**0.099***

Coefficients, followed by their standard errors

Significance denoted by *p<0.10; **p<0.05; ***p<0.01

Model 3 tests H1 (*Products whose creators are perceived as independent will be of significantly greater interest to lead users than products whose creators are perceived as non-independent*), and I confirm the predicted result at strong significance (p = 0.022), with Model 3 raising R-Square to 66.9 percent. Products created by entities that are perceived as independent indeed have an advantage, in terms of the interest of those products to the hardcore gamer. This finding is highly significant (p = 0.01) in Model 6 as well, which will be described shortly.

H2[34] and H3[35] is tested in Model 4, resulting in a highly significant change from Model 2 (p = 0.004). This model raises R-Square to 68.8 percent, with the two centrality measures producing dramatically different levels of significance. Degree centrality, the proxy for the *quantity* of ties between game creators which can be thought of as indicating product familiarity, showed a negative relationship with INTEREST, but it is one that is not significantly different from zero. On the other hand, the proxy for *quality* of ties, Betweeness Centrality, or the indicator for product uniqueness, was highly significant (p < 0.001) in both Model 4 and all subsequent models as well. These findings suggest that creators who are in a position to influence and control non-adjacent actors though their intermediary positions confer highly significant advantages to the games they create in terms of user interest. These games potentially employ skills and routines or sources of knowledge and information that are non-redundant in the network, and may be connected to distant nodes of the network in unique ways. Discussion of how the two measures of centrality may indicate different skills or human capital will be deferred to Chapter VIII, later in this document.

Model 5 tests H4 (*Lead user interest in a product will have a significant and inverse relationship with the number of follow-on products from its family*), and results in a highly

---

[34] H2: The Betweenness centrality of a product's creators will be significant and positively related to lead user interest in the product.

[35] H3: The human capital (or skills) requirements for driving lead user interest, are different from those that are significant to developing successful product families.
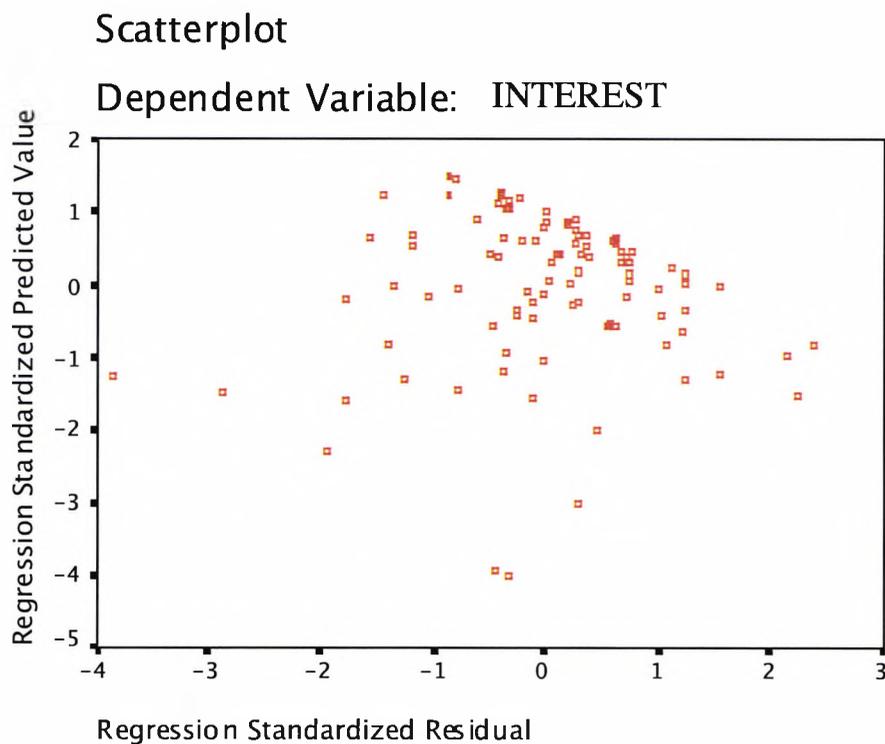
significant change to F ($p = 0.007$), indicating that lead user interest does have an inverse relationship to products from highly exploited product families. We should expect that lead users have a preference for original as opposed to franchised products and those products deeply embedded in product family models may therefore be at a disadvantage. The R-squared value from adding Model 5 to the control model (Model 2) is raised from 0.652 to 0.675   Model 6 adds the full model up to that point, by adding the independent variables from Models 3 and Model 4, to Model 5, and shows a strong fit (R-Square = 0.722; $p = 0.001$).

Because of the time trend indicated in the analysis, in Model 7, shown in Exhibit VI-c, I added an interaction between Year of Launch (YOL) and firm reputation (INDPNDNT). As noted in the description of the variables earlier, for this interaction, I coded YOL with values from 0-10 so that higher numbers represent earlier launch years. This interaction proved to be strongly significant ($p < 0.05$), indicating that the effect of reputation, which here is the sense of a game's creator perceived as independent, is moderated by the year of launch. However, rather than the anticipated inverse relationship, a positive relationship between hardcore gamer interest and this interaction exists, indicating that games from producers perceived to be independent are of more INTEREST, the earlier they were launched. This indicates a strong appreciation for collectibles, classic, or potentially cult games launched by indie developers with a greater than 325 point gain in lead user interest for each earlier year. Addition of this interaction to Model 6 is strongly significant ($p = 0.016$), and R-Square, the summary measure of goodness of fit of Model 7 is 0.738 at the conclusion of the analysis. Adjusted R-Square, which adjusts for the number of independent variables, at 0.695 is also high and indicative of a strong fit. We can conclude that the independent variables appear to reliably predict the dependent variable, and therefore show a strongly significant relationship with the dependent variable. The significance
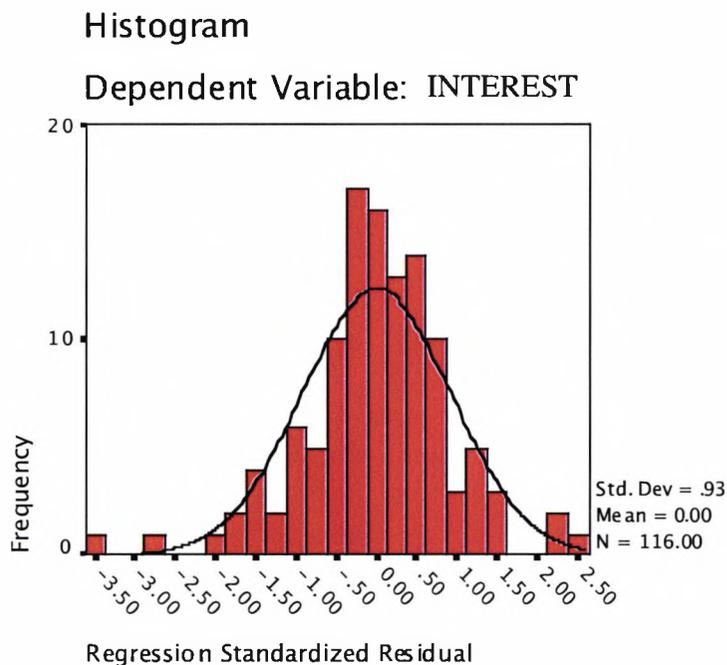
or ability of each independent variable to predict the dependent variable has been flagged in Exhibit VI-c, and the other interactions presented there will be discussed in the next section.

The plot for the standardized predicted variable and the standardized residuals may be found in Exhibit VI-d that follows. The data generally fans out, and there does not appear to be a discernible pattern in the plot indicating concern for mis-specification or heteroskedasticity, so based on this visual test, more formal tests such as RESET or White's are not presented. The histogram showing the idealized normal curve is presented in Exhibit VI-e and the distribution of the residuals appears adequate. The next Exhibit VI-f of the P-P plot of residuals (ZPRED, standard normal of predicted variable; and ZRESID, standard normal of regression residual) was performed as an additional check. It does not indicate an issue either, and shows that the thicker curve of data points lie quite close to and generally follow the thinner diagonal.
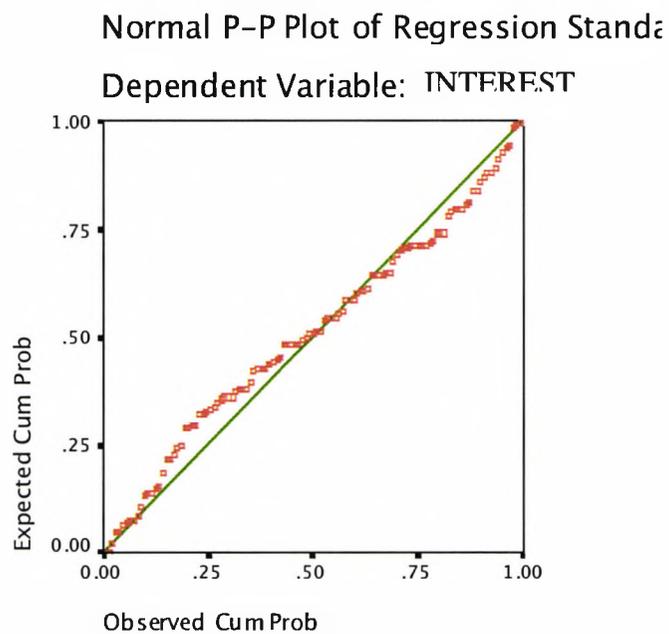
Exhibit VI-d: Standardized Predicted Variable and Residuals

Scatterplot

Dependent Variable: INTEREST

Exhibit VI-e: Histogram of Idealized Normal Curve

Histogram

Dependent Variable: INTEREST

Std. Dev = .93
Mean = 0.00
N = 116.00

Regression Standardized Residual

Exhibit VI-f : Normal P-P Plot of Residuals

Normal P-P Plot of Regression Standa

Dependent Variable: INTEREST

The final regression equation for the predicted dependent variable is as follows:

INTEREST = 8651.135 - 3660.004***(YOL_97) - 2827.118***(YOL_98) - 3022.333***(YOL_99)
- 2480.756***(YOL_00) - 944.921**(YOL_01) - 608.032(YOL_02)
+ 621.601* (PLATFORM) + 935.323*** (RPT_PERF) + 680.327***
(GAMEQLTY)
- 1001.753*** (GENRE) + 279.484* (DIFICLTY) - 427.63 (INDPNDNT)
+ 225.399*** (CENT_QLTY) + 0.696 (CENT_QNTY) - 29.453*(FAMPRODS)
+ 325.451** (YOL*INDPNDNT)

A synopsis of the meaning of the estimates that proved to be significantly different from zero, in terms of the relationship between the independent variables and dependent variable is below:

o For every 1 unit increase in CENT_QLTY, there is a 226 unit increase in the predicted lead user INTEREST

o Model 3 and Model 6 indicates that relative to products launched by more mainstream producers, products whose creators are perceived to be independent are, on average, of significantly more interest to hardcore gamers. However, in Model 7, the full model, I show this finding is moderated by YOL and so the effect of creators' reputation is such that the influence of historical success is stronger on lead users' interest, as we see from the interaction of YOL*INDPNDNT. For games launched one year apart by creators perceived to be independent, there is a 326 point advantage in INTEREST for the game launched earlier.

o For every 1-unit increase in a games' difficulty, a game is predicted to be of more interest to hardcore gamers by about 280 user INTEREST points.

o Games from the more commercial genres are disadvantaged in terms of hardcore gamer interest, by over 1000 user INTEREST points.

o For each 1-unit increase in game quality, as rated by the interactive entertainment press, a game gains 680 points in predicted INTEREST.

o For every subsequent appearance a game makes on NPD's top selling annual list, it is predicted to be more interesting to hardcore gamers by 935 user INTEREST points.

o On average for the entire dataset, relative to games launched in the year 2003, games launched in earlier years are of less interest to hardcore gamers. This disadvantage is strongest for games in 1997 (3660 INTEREST points), followed by games launched in 1999 (3022 INTEREST points).

6.2   A Note on Interactions

Although I note Model 7 as the final model for my study, other interactions that I considered are noted briefly in this section. The analyses for two of these were presented in Exhibit VI-c earlier in this chapter.

Apart from YOL*INDPNDNT, which proved to be significant and was included in my final model, a second interaction, that showed modest significance at best (p = 0.096)for an inverse relationship to INTEREST, was between independence (INDPNDNT) and the quality of ties of a product's creators (CENT_QLTY). My reasoning here was that hardcore gamers have an inherent appreciation for games from *indie* producers but many of these producers tend to be on the periphery of successful games development with probably lower centrality scores across the board.

As noted in Chapter IV, however, the more successful of the *indie* creators, who understand how to make high performing games should have better connections with mainstream producers and therefore link the outliers from the *indie* community with this mainstream community. In social network terms, we should expect that these independent creators have higher Betweenness Centrality scores. Ironically though, while Betweenness and INTEREST

have a highly significant, positive relationship for the dataset; for independent creators in particular, these same links appear to dilute lead user interest. Discussion of the implications of the results obtained for Betweeness and for INDPNDNT*CENT_QLTY will be included in Chapter VIII as well.

A third interaction that I have included in Exhibit VI-c is between the number of follow-on products (FAMPRODS) and platform. It too produced a modestly significant result (p = 0.099), indicating that for console games in particular there is an inverse relationship with INTEREST, compared to titles developed on the PC platform. It is generally true in the games software industry that the console market is the more commercialized platform where the overuse of the franchise model, and excessive exploitation is most apparent. This result suggests that console games have an inverse relationship with INTEREST as the number of follow-on products in their family grows.

A synopsis of the interactions studied, which includes those that did not prove to be of any significance are contained in Exhibit VI-g that follows, alongside the results of each.

Exhibit VI-g: Interactions Investigated

No.	Interaction	Significance of Model	R-sq
1	YOL*INDPNDNT	0.016	0.738
2	FAMPRODS*CENT_QLTY	0.305	0.725
3	FAMPRODS*INDPNDNT	0.301	0.725
4	INDPNDNT*CENT_QLTY	0.096	0.729
5	INDPNDNT*CENT_QNTY	0.344	0.724
6	FAMPRODS*PLATFORM	0.099	0.729
7	FAMPRODS*GAMEQLTY	0.754	0.722

Chapter VII – CASE STUDIES

A central idea in this thesis concerns how creators of games utilize the knowledge of lead users to innovate. While there is statistical work that supports what is going on in the games software industry, it is extremely important to understand the workings of this industry in terms of how lead users may or may not affect the process, at a more descriptive level. Ultimately, although the market appears to be quite saturated with brand franchises, successful game franchises are still a relatively small number.

To understand and have a meaningful discussion on how lead users interact with different types of products and the impact they are capable of having on performance, I qualitatively examine 3 separate games in this chapter. Because this section of my thesis relies on a largely inductive approach and anecdotal evidence to gather inferences on the importance ascribed to lead users and outcomes, I am dependent upon the quantitative analysis to empirically test the hypotheses.

7.1 Methods & Design

Using 3 different games as case studies, I look for insights to scope and begin to understand the importance ascribed by firms to lead users and where limits to that importance may lie, within an environment dominated by these users. Readers should note that each of these games is part of a product family, and the cases were chosen for their varying appeal and impact on the lead user community.

A wide variety of products exist in games software, that may be classified on a potentially endless number of dimensions. In this thesis, two dimensions are of major importance and so were used as the basis for case selection: 1) A game's appeal to the casual,

versus the hardcore gamer market; 2) The extent to which the game is creative versus purely entertaining. These may be visualized in Exhibit VII-a that follows:

Exhibit VII-a: Case Selection
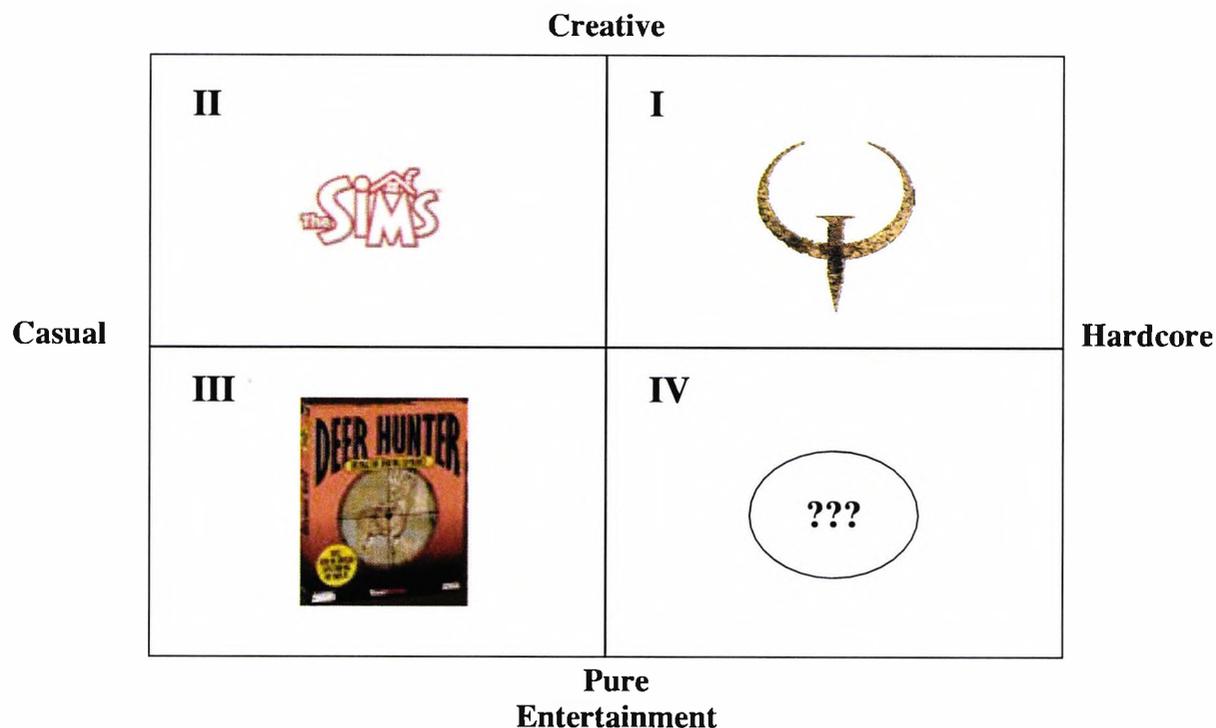
The first case (Quake, quadrant I) is of a game that directly targets the hardcore gamer community; The second case (The Sims, quadrant II) does not target hardcore gamers, but the game's creativity is relatively undisputed in the games industry and hardcore gamers have played a role in the game's testing and diffusion; and the final case (Deer Hunter, quadrant III) is of a game not at all likely to be appreciated by hardcore gamers, although the game achieved notoriety by becoming a top-selling game, nonetheless. Actual case selection was made based on whether there was clear evidence that a game was located in a particular quadrant rather than trying to estimate its exact positioning within the space. Additional factors I considered in

making the decision was the availability and accuracy of data that was available in relation to the game. As noted earlier, accuracy of data can be an issue in this industry,

I omitted to include a case in quadrant IV as I was unable to gain clear agreement on whether there are cases currently of successful product families that convincingly fit its proposition, which presumably comprises of purely entertaining games that appeal to the hardcore segment. Perhaps the closest candidate for that quadrant is the Madden NFL series, although the caveats offered on page 49 prevented its inclusion in this study.

By analyzing these games at a more micro-level, I draw insights from the diverse roles the lead user has played from highly-involved, to no planned involvement with products and also with creators, alongside such considerations as the product's social impact, its development and commercialization effort, and its performance. Here, I study each case for evidence of confirmation and contestability to my propositions.

1) **Quake:** This first case is that of a game created by independent developer id Software, a firm that has become well-known for its non-traditional product families, and whose lead programmer and co-founder, John Carmack, is revered for his creativity throughout the gaming community. A conscious part of id Software's strategy through their FPS (First-Person Shooter) titles is to engage and support the hardcore gamer community, whom it considers to be its target audience.

2) **The Sims:** Heralded as a social movement, the Sims launched what is considered the most influential and successful product family in gaming on none other than the PC platform. Game designer and co-founder of Maxis Software, Will Wright, has been touted as one of the most innovative minds in gaming, yet The Sims is aimed squarely

at the female and casual sector, so should have held little appeal for the hardcore gamer market.

3) **Deer Hunter** – This product launched as a low-tech, hunting game to Walmart's distribution at a price point so low it broke industry records, and went on to become the 2nd highest selling game of the year in terms of units sold. It holds no appeal for hardcore gamers and was in fact in a unique position to draw heavy criticism from them.

Data for the case studies was collected at both the primary and secondary level. Primary data was gained through interviews, online communities, and company records. Since the interviews had been conducted earlier in the process and therefore were not specifically designed for these individual case studies, when relevant, I followed up with some of the interview candidates to pose additional questions via telephone and email. I extensively used secondary data such as media reports, consultant reports, and information from other industry publications.

7.2   Case Study Findings

For this chapter, I studied 3 separate games that are each part of a product family or exploitative strategy, with varying appeal and involvement as it concerns the hardcore gamer community, to test the importance of the lead user to an organization's strategy under varying scenarios. Overall, a major goal of this second study was to bring to light issues that may not have been picked up when using other, more quantitative and stringent methods. As with my statistical study, the discussion of the implication of case study findings is deferred to the next chapter.

7.2a   Case #1: Quake
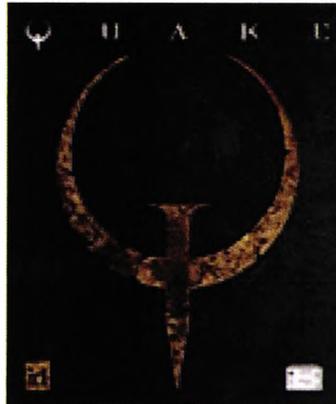
Score: 100   **Source: All Game Guide**

"After "DOOM" revolutionized first-person shooters, Quake raised the bar and set standards featuring improved visuals in a 3D environment, excellent controls, numerous monsters and a vast online experience."

Score: 100   **Source: Hot Games**

"The essential 3D first person multiplayer experience of our time."

Score: 93   **Source: GameSpot**

"If you're into action games, and even if you're not, you should be playing Quake right now – it's as good as PC gaming gets. "

Score: 91   **Source: Game Revolution**

"Quake is not just another 3D shoot-em-up game. It's a whole new level of gaming. The amazing performance and features of Quake are the future of gaming. Whether you are new to this type of game or you are an old "Doom" hack, you will fall in love with Quake."

Exhibit VII-b: Quake Screenshots

Exhibit VII-c: Quake Statistics

Title	Quake
Publisher	id Software
Developer	id Software
Metacritic score	94
Genre	Action, First Person Shooter (FPS)
Players	16
Levels	32 single player levels + 6 deathmatch levels
ESRB Rating	Mature (M)
Release Date	May 31, 1996
Target Audience	Hardcore gamers
Press Rating	9.3
User Rating	9.1
Gameplay Rating	9.0
Graphics Rating	9.0
Audio Rating	10.0
Difficulty	Hard
Learning Curve	About 1 hour
Sequels	4 + Mobile game + 5th scheduled for 2006
Add-on packs	2 official expansion packs
Known mods (ModDB)	107

The original game in the Quake series was released for the PC around the middle of 1996 by independent developer id Software, and not long afterwards, was ported to the popular video consoles. Between the innovation crafted by revered lead programmer and co-founder John Carmack that included 3D models and revolutionary level architecture; a difficulty rating of "hard"; a learning curve of 1 hour; and a soundtrack that featured Nine Inch Nails, Quake had many of the elements important to success with its primary target market: The hardcore gamer.

Quake was in development since id Software launched its groundbreaking "Doom" title, and Quake's development eventually took a whole 3 years. John Carmack has a reputation for perfecting the technology and experience supporting his games with seemingly little concern for budget nor timelines, so gamer communities had been discussing Quake a long time before its release. Despite all the hype, Quake still over-delivered with "an edge-of-the-seat adrenaline rush that begins the moment you set foot in its darkened halls...Once again, the team at id Software has created a no-apologies, ultra-violent gorefest sure to be the new battleground of choice for single and multi-player combatants worldwide" (Ward, 1996).

Quake advances the sub-genre in the action category known as the *first-person shooter* that id has become famous for, by using at least 2 radically new innovations:

1) 3D real-time rendering: Quake uses 3D models, instead of sprites that are pixel-based, dramatically improving the visuals and experience. The 3D technology was implemented in true form, which meant the views are realistic and for the first time, attacks were no longer confined to particular angles. The learning curve for new players was steep, but the control that came from mastery was unlike anything most gamers had experienced before.

2) Online Multiplayer: Quake was also the first game with an online multiplayer to take advantage of Internet technology[36] and as a result, it could accommodate 16 separate challengers. After the release of Quake, most other games from the first-person shooter and real time strategy genres contained a multi-player feature.

In Quake, the player assumes the identity of a marine sent into a portal to stop an enemy code-named "Quake" in an unknown dimension, who is using the portal to wreak havoc. Quake

---

[36] A list of Quake servers may be found at http://www.pipo.com/quake

has 4 worlds and over 30 levels, so is not for the feint of heart. To maximize the effect of Quake, gamers must be prepared to change various settings on their hardware. Quake uses four different difficulty settings, beginning with Easy and progressing to Normal, Hard and then to Nightmare. Deathmatch mode also allows gamers to play against the design team at id, a feat that requires great skill. After collecting the four runes from the other scenarios, gamers are allowed a final battle before being allowed into Quake's home world. The best players focus on implementing a sound strategy, rather than merely firing accuracy, or chance.

Although Quake is part of a product family that has 3 additional games which have combined sales of over 4 million units and a version for mobile phones that was released in 2005, these games do not follow the usual exploitative model for product family development and most gamers do not consider them true sequels. The focus of the series has changed considerably from game to game, and apart from the naming convention, each subsequent title has little to do with its predecessors. Apart from id Software's dedication to providing its fans with innovative and unique gaming experiences with every product it releases, the departure of designer John Romero, and the decisions of id's management team may also have played parts in this discontinuity. In fact, Quake II was to launch a new franchise but id's management became frustrated with the brand search and decided to use the Quake name instead. If anything, the other titles tend to follow Quake II rather than the original Quake. To illustrate, Quake IV was developed by Raven Software and it extends some of the concepts developed in Quake II. It is more of a single player title, and is based on the Doom III engine[37].

The popularity of the Quake games allowed id Software to collect auxiliary revenue from strong demand for the licensing of Quake's core software by other developers who wanted to

---

[37] A game engine is the core software component of a video game that renders graphics facilities, platform abstraction, and other needed technology. Licenses for high-end game engines range from $10,000 to $750,000 and tens of companies have been known to partcipate, as with the case of the Unreal engine.

take advantage of the state-of-the-art technology id had developed, and thereby shrink lengthy product development cycles and complexity. For example, the Quake III multiplayer engine has been used in titles such as Medal of Honor: Allied Assault, and Call of Duty. Probably for the same reasons, much of the original Quake engine remained in the next two sequels. Engine licensing gave developers the freedom to focus on game assets and content such as characters, levels, and graphics, while relying on proven, state-of-the-art technology.

In 1999, id released Quake's engine source code via the internet under the terms of the General Public License (GPL), which prompted derivative versions of the engine such as Twilight and DarkPlaces. Id Software had made the Quake C source and compiler available to programmers shortly after the game launched, which encouraged the creation of "mods" or modifications to the game by the lead user community.

Mods, introduced in Chapter III, can be partial conversions that add new content to a game, or total conversions that create an entirely new title and with occasionally even greater success and popularity than the original game. An example of a total conversion that enjoyed such success is CounterStrike, that relies on Half-Life's engine and played an enormous role in Half Life's sales.

Mods have become increasingly important to commercial success and since the Internet allows easy distribution, many developers like id Software, Valve Software, and Epic Games offer a higher degree of support to mod creators. A mod can be open source, and is usually available at no cost unless a decision is made to incorporate it into the original title and offer it at point of sale.

In response to id's posturing in 1999, the CFT (Capture The Flag) mod released that year by hardcore gamer David Kirsch went on to become the most popular mod created. The ReaperBot from Steve Polge was also created in 1996, the first and still considered one of the

best "bots". Bots are robotic computer controlled entities that work via artificial intelligence and simulate "an online or LAN multiplayer human deathmatch, team deathmatch opponent or a cooperative human player" (Wikipedia, 2006). The following year, Kirsch was under contract with id Software for various applications of CTF including Quake II and Quakeworld.

So strong was this game's impact on the hardcore gamer community, that with no support from id Software, a group of gamers organized a conference known as Quakecon, devoted to multiplayer gaming and featuring id's titles. Quakecon became a four-day annual multiplayer gaming event largely planned and managed by volunteers, who were also avid gamers and fans of id Software's titles, including Doom and Quake. Starting in 1996 with attendance of roughly 100 people and mere t-shirts as prizes, Quakecon was attended by 650 gamers in 1997, and 1100 gamers by 1999, which was the first year in which id became officially involved. id Software's team and their publisher, Activision have gradually begun to participate more via keynotes and sponsorship, as demands of the attendees for greater organization began to grow. Today, QuakeCon is primarily supported by id Software along with sponsorship of firms such as Activision, nVidia, AMD, Aspyr, Apple Computer, ATI Technologies, Alienware, Intel, Logitech, Linksys, and Lucent Technologies. Event managers have added seminars and convention space for vendors. Quakecon has an online presence year-round as Appendix IV attests, and membership in the forums is a requirement of registration.

id was at the center of negative publicity in 1999 when 2 students, one of whom was a Doom and Quake fan, shot and killed 14 other people in Colorado's Columbine High School. This event began hot debates on the topic of violence in games, that continues today, yet Quake's popularity continued relatively unabated: Quake III was released in North America later that year and sold 50,000 copies in the first 3 days of its release; By 2002, Quakecom had grown to 3250 attendees and the count was over 6000 for the 2005 conference.

id's management approach has become a model for independent or *indie* developers, and it is easy to see that leaders capable of orchestrating a fine balance between commercial and creative success unquestionably control the firm. Todd Hollenshead, CEO of id software, talked about the high need for indie developers to pay attention to the business end of the games software business during my interview with him. He was firm in his belief that the creative freedom id is allowed, that enables Carmack and his team to push the bounds of innovation is a direct outgrowth of the firm's proven commercial success.

Even id's business strategies are hardly traditional ones. The shareware model, whereby a trial version of a software product is distributed for free and payment is required beyond a set period of time, was advanced in the 1990s to games software by then-fledgling developers like id, who subsequently enjoyed tremendous success with the model. Despite the occasional vocal dissatisfaction displayed by powerful distributors in the value chain, id has continued to allow its fans the ability to acquire titles directly from the firm.

Quake IV and the latest product addition to the Quake family, known as Quake Wars, that is set for a 2006 launch have not been developed by id Software. The firm's detachment from the series may very well be a sign that Quake may be at the end of its creative lifecycle and what is left is a purely incremental opportunity. No matter what the future holds for the franchise, nobody can dispute the success it has enjoyed and the performance of its flagship product: Despite the short retail relevance of titles, Quake remained the most popular online game for five years and the official game of online multiplayer tournaments, until it was replaced in 2001, rather ironically, by the mod to Half-Life known as CounterStrike.

7.2b   Case #2:   The Sims
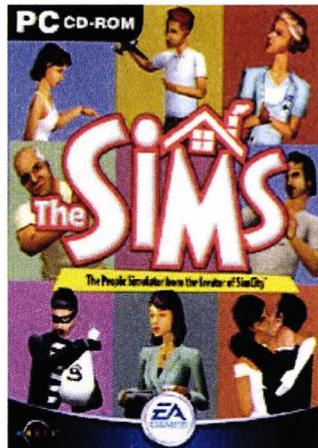
Score: 91   Source: Game Revolution

"This is one of the most original and innovative games we've seen in ages."

Score: 100   Source: GamePro

"The uniqueness of the game, the sound, graphics and the ability to control a little Sim life hooked me almost immediately."

Score: 90   Source: All Game Guide

"The more I played this game, the more I liked it. I found it relaxing and challenging at the same time, and my level of interest has been maintained over the past few weeks, especially because of all the new add-ons that Maxis is serving up at their website."

Score: 91   Source: GameSpot

"The Sims' actual gameplay is rather limited in some respects – either by odd inconsistencies or by actual restrictions placed on your actions."

Score: 86   Source: Gamespy

"Every once and a while though, a game comes along that makes you re-evaluate that computer gaming is creatively bankrupt, breaking all the molds and slapping you in the face with something genuinely original and creative. The Sims, from Maxis, is one such title."

Score: 90   Source: CNET Gamecenter

"…and this absurdness is what makes The Sims tragic, funny, mundane, and one of the most entertaining games I've seen in a long, long time."

Score: 90   Source: EuroGamer

"The lack of any real objectives becomes somewhat tedious after a while, but it is still hard not to recommend The Sims to everyone."

Exhibit VII-d: The Sims Screenshots

Exhibit VII-e: The Sims Statistics

Title	The Sims
Publisher	Electronic Arts
Developer	Maxis Software
Metacritic score	92
Genre	Simulation, Strategy
Players	1
Levels	At least 7 multiplayer unlockable levels
ESRB Rating	Teen
Release Date	January 31, 2000
Target Audience	Female (52%) and casual gamers
Press Rating	9.0
User Rating	8.8
Gameplay Rating	8.0
Graphics Rating	8.0
Audio Rating	10.0
Difficulty	Medium
Learning Curve	About a half hour
Sequels	2
Expansion/Add-on packs	7
Known mods (ModDB)	4

Drawing heavily from the time-honored concept of playing with a dollshouse, The Sims is what has become known as a God-game in which players have the ability to create, control, and manage the lives of digital people and their worldly possessions. The brainchild of industry veteran designer, Will Wright from Maxis Software, the game features an environment articulated immaculately down to almost the last detail and colorful, highly animated characters who are designed to stimulate the imagination.

Gameplay in The Sims is admittedly limited by occasional inconsistencies, the artificial intelligence, the logic of its restrictions, and the apparent lack of a definite goal or objective, all of which hardcore gamers have difficulty reconciling. Some of the inconsistencies that critics of the game tend to focus on are design-related issues such as the fact that characters do not age, there are no differences in consequences or impact from professions chosen in the game, graphics are outdated, and only "adequate" technical elements exist[38]. However, hardly anyone can disagree that players have an amazing number of options and freedom of control over the characters' lives, nor that The Sims is possibly the most popular franchise in games, to-date.

As a testament to The Sims future potential, Electronic Arts (EA) purchased Maxis Software in a deal estimated at $125 million in 1997, shortly after the firm announced a $1.7 million loss for its prior fiscal year.[39] Since the merger, EA has allowed Maxis to operate rather independently and recently made the decision to move Maxis staff out of the EA campus in Redwood Shores, CA, back to their own offices in Emeryville, CA, to retain the team's creativity and autonomy in game development.

The original inspiration for the game came from architecture. Wright was trying to show how the design of something could impact the way people behave and live within it, when he stumbled upon the idea for The Sims. Essentially, the Sims were there only in the context of

---

[38] http://www.rottentomatoes.com/g/pc_games/sims/
[39] http://www.wired.com/news/business/0,1367,4273,00.html

evaluating the houses, but during development, game testers, who most often are hardcore gamers and employees, decided the people were more interesting than the houses.

Technically, the game has unlimited replay value and Wright uses the concept of open-ended gameplay with the intent that The Sims function more like a toy than a game. Even though it was not the first game to have attempted this technique (e.g. Harvest Moon), The Sims' critics still argue the lack of a real goal or objective is frustrating. Still, these design choices are also why first-time users are not intimidated playing the game. It offers an environment most everyone is familiar with, and so it is easy to project oneself into the game, then shift over time from playing, to directing or storytelling.

Depending on how characters are chosen or designed, and the subsequent tradeoffs and choices made such as teaching them skills, meeting their needs, making purchases, and interacting with others, players contend with restrictions, changes to their Sim, and unexpected events which can often be quite humorous. Simlish, the language spoken by the Sims is relatively indecipherable, yet players nevertheless can easily infer the emotions and intentions of characters. Mistreating the characters can have adverse consequences such as death, depression, insubordination, and illness, that are in themselves states of failure.

In a market dominated by hardcore gamers who are generally male, Maxis proudly and publicly announces that the target market for The Sims is the casual gamer and the female gamer. A whole 52 percent of Sims' users are female, and the majority of these players are under 25 years of age. Maxis also believes that a lot of Sims players are new to computer games.

The pattern, according to Will Wright has been that a hardcore gamer purchased and brought the title home, "then, frequently, their spouses, their wives, or girlfriends, or kids will start playing it, and really get into it more so than the hardcore gamer that brought it home". The

appeal to women was not entirely surprising, since 40 percent of Maxis' development team was female and the basic concept intuitively appeals to the female sector.

According to Wright, the casual gamer target audience had much to do with the bandwagon effect created, because of the nature of that user's level of excitement expressed via word-of-mouth: " I think a lot of our players were first time computer gamers. If you think back about it, you know, how excited you were when you first started playing computer games, and imagine someone experiencing that for the first time – they're probably going to be much more vocal about what they're doing. They're going to be much more excited about, "Wow! Look at this game! I never thought I'd play a game before! I've got this game that's really cool because you can do x, y, and z." So, they're just going to talk about it more. That's another degree of compound leverage."

Not that knowing they are not the intended audience has kept the hardcore segment out from Sims-related investigation, discussion, and tinkering. Hardcore gamers have played both formal and informal roles in the game's success, or at the very least, its publicity:

- o Hardcore gamers played a role in introducing the product to casual or new gamers such as girlfriends and family members, as noted earlier, so they helped diffuse the product and virtually put The Sims into the hands of its target audience.

- o On the formal side, Maxis recruited hardcore gamers during the product's development. Each week 20 of these gamers would receive mail from Maxis on plans for the game, tools, and features and they would be asked for their feedback. By getting these gamers involved actively and early, discussion and communities fueled The Sims' success. Hardcore gamers understood they were not the primary

audience, but could still appreciate the game and they may have had intimate knowledge of the game's popularity through family members and girlfriends.

- o Informally, third party software to torture the Sims became available and even as recently as after the launch of The Sims 2, it was discovered that odd behavior in Sim characters was the result of mods and unauthorized tinkering by hardcore gamers that was overriding the game's defaults and being transmitted through the exchange. Maxis had to begin educating users on how to remove hacked features from games to avoid having them interfere with gameplay. In true form, hardcore gamers themselves also developed and published a program that scans for patches in The Sims 2 game themselves, called the Sims 2 Hack Scanner and Lister.

In the event it is not clear to readers, the potential for end-user modifications varies greatly between games, although there still seems to be little correlation with that potential and the number and quality of mods created. The Sims allows changes in some aspects of the game, such as adding new clothes, but not in others such as characters' occupation or skills.

Word-of mouth has been immensely important to The Sims success and it is for that reason that Maxis engages its user community with upgrades, communication, and other online activity that occurs almost constantly. Maxis has made available an amazing repertoire of free downloads that enliven the game experience. The Sims is not a multiplayer game, yet the online community is in Wright's words, "Absolutely vital". Sharing what players have done, swapping stories and pointers is a critical part of the Sims experience. In fact, Will Wright attributes the high anti-piracy alertness in The Sims community to Maxis' commitment to community management.

After such a breakthrough title, what happens next in the product family is of enormous consequence. Following its release, The Sims has contributed to a sequel, The Sims II, and 7 expansion packs: Livin' Large; House Party; Hot Date; Vacation; Unleashed; Superstar; and Makin' Magic. It has also supported several compilations or product bundles: Deluxe Edition, Double Deluxe, Mega Deluxe, Complete Collection, Expansion Collection Volume One, Volume Two, and Volume Three, and Expansion Three-Pack Volume 1 and Volume 2. The Sims has been ported to several video game consoles. A portable version exists and a mobile version for cellular telephones is also planned.

Given their tremendous success, the 7 Sims expansions have appeased Sims fans while the game remained essentially the same for about 3 years, however, the firm's foray into the multiplayer market with The Sims Online that was launched in December 2002 did not achieve the sort of success that was expected of it.

The Sims Online is considered at the most "a lateral move for The Sims rather than a true step forward". (White, 2006). The focus became too heavily chatroom-oriented, the community itself degenerated heavily, and not many of the participants contributed in an interesting manner. Maxis admits at least two errors for this follow-on product: First, it relied too heavily on players being creative and providing entertainment for other players, which is a difficult premise given that the target audience is new to gaming and potentially even computers. Second, the game's pricing strategy was not a sound one. Sims products were usually sold for $29.99 to $39.99, but Sims Online was priced at $49.99, as well as a subscription fee at launch. After Maxis collected negative user feedback, they adjusted the price downward to $29.99 some eight weeks later (Lewis, 2003).

Aside from The Sims Online, every release has been a best seller and in fact, for one of the weeks in August 2005, no less than 5 of the 10 slots on the PC sales chart was occupied by a

Sims title. The most recent release, The Sims 2 has updated the game with more intelligent AI and better graphics. By many reviewer accounts, Maxis has supposedly repeated the formula in The Sims 2 rather than introduced anything really original. Another problematic aspect is that the hardware requirements are quite substantial for anyone with less than a high-end machine and since the target profile is not that of a hardcore gamer with the latest hardware, some problems with load times and slowdowns should be anticipated.

Most games conference audiences have become familiar with Wright's struggle and persistence with this idea for a game, across several years in the games industry without proper backing, mostly because his audience was not the critical hardcore gamer segment, but the casual and female sectors turned out to be highly lucrative markets. First released in February 2000, The Sims has sold over 6 million copies worldwide, won the Game Developers Choice Award for the Game of the Year award in 2001, and is unquestionably one of the best-selling PC games in history.

When Will Wright was honored for game of the year, he had this to say, ""I've received a lot of awards for The Sims, but this matters the most because it was given by other developers. And most importantly I have entertained the hardcore, while the game is still enjoyed by my mother and sister, so it gives me a lot of hope for the industry."

7.2c   Case # 3: Deer Hunter
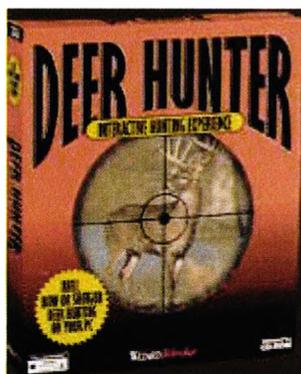
Score: 70   Source: Adrenaline Vault

"Much of Deer Hunter's popularity can certainly be attributed simply to the original nature of the title. For whatever reason, there has never been a realistic computer hunting simulation… Like it or not, Deer Hunter is a game whose time has come."

Score: 55   Source: Gamespot

"While Deer Hunter may be fun and charming the first few times you play the game, it doesn't go much beyond that."

Score: 64   Source: Mobygames

"As the first hunting game to tackle the strategy of hunting, Deer Hunter has gone on to spawn an entire hunting game genre that no one expected. The game climbed to the #1 selling position and remained there for quite some time, completely confounding the game development establishment. While admittedly simplistic in graphics and design, the game had a charm that non-hunters or hard-core gamers were simply never able to appreciate or even acknowledge. "

Score: 40   Source: Computer Games Magazine

"We're going to go after all the animals,"
> - *Paige Carlson-Winch, Product and Affiliate Sales Manager for WizardWorks, quoted in Computer Retail Week.*

Exhibit VII-f: Deer Hunter Screenshots
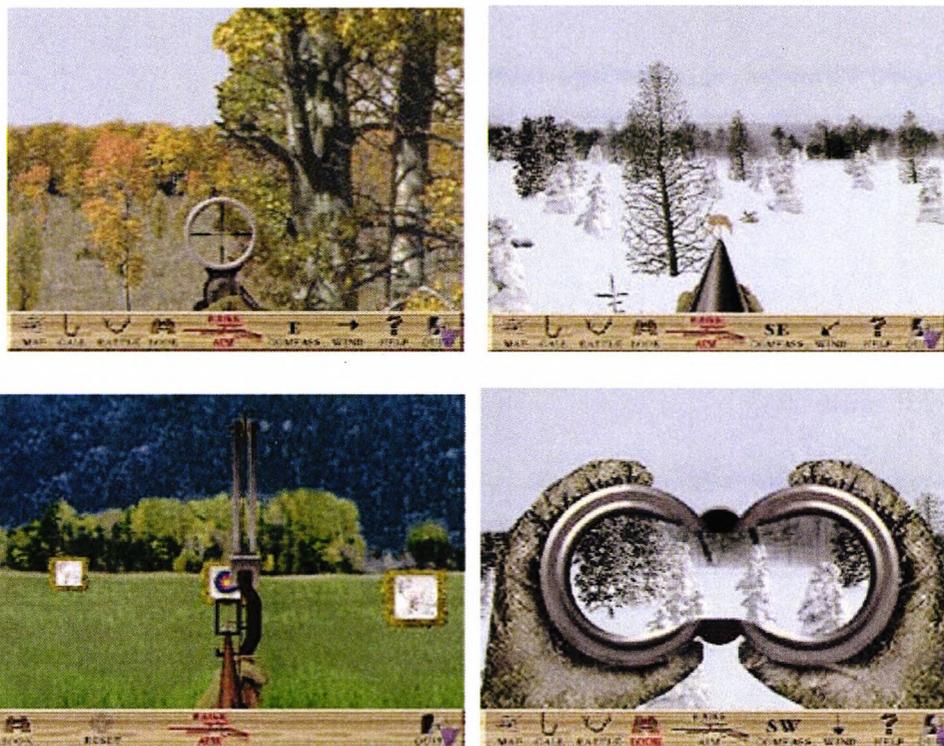
Exhibit VII-g: Deer Hunter Statistics

Title	Deer Hunter
Publisher	Wizardworks
Developer	Sunstorm
Metacritic score	n/a
Genre	Sport, shooting
Players	1
Levels	3
ESRB Rating	Teen
Release Date	December 31, 1997
Target Audience	Casual, price conscious, hunting fans
Press Rating	6.5
User Rating	6.0
Gameplay Rating	6.0
Graphics Rating	4.0
Audio Rating	5.0
Difficulty	Medium
Learning Curve	About a half hour
Sequels	7
Add-on packs	1
Known mods (ModDB)	0

In 1998, a low-technology, low-cost, low-priced title called Deer Hunter title launched exclusively to Wal-Mart's distribution, and emerged as the second-highest selling PC title for that year. Its success trounced that of Myst, a game that is still considered amongst the most highly innovative of all time by gamers and industry veterans, and which in 1998 sold a highly respectable, 4 million units. In fact, Deer Hunter outsold even Quake II and Riven, the highly sought-after sequel to Myst. Deer Hunter was aimed squarely at carefully researched Wal-Mart's shoppers, at a value pricepoint that made sense for them. It cost a remarkable $70,000 to develop, and was developed in only 3 months by a part-time artist and 3 programmers, one of whom was a college intern.

There had been many fishing games, as well as boating and racing games, but to that point, there had been no hunting game that was a decent simulation of the experience, nor was there much activity in the value-priced market (Boer, 1999). When Deer Hunter was developed and launched most games were targeting hardcore gamers, but a substantial casual gamer market was emerging for whom game controls and play needed to be simple, interesting, and understandable, at affordable prices.

Impetus behind the game's development came from Robert Westmoreland, a Walmart business executive[40] who began pitching his ideas for a game based on his study of Walmart shoppers. In spite of the total lack of interest from multiple game publishers, some of whom had allegedly referred to the idea as "ridiculous", Westmoreland remained convinced that customer interests were "at odds with the kinds of games being sold in the store"[41] and eventually won out. The publisher/developer team that he recruited to bring the title to market was Wizardworks and Sunstorm Interactive, most known for their successful 3D game add-ons.

---

[40] http://www.gamasutra.com/newswire/news/index20000501.htm
[41] http://www.planetdeusex.com/witchboy/articles/hkdiary/index2.shtml (2003)

In Deer Hunter, gamers select either a shotgun, rifle, or bow, then an area in which to hunt from 4 different locations: a Colorado forest, a snow-laden Indiana landscape, woodlands in Arkansas, or a target range. The natural camouflage of these environments allow for different levels of play, with snowy Indiana being the easiest, and the woodlands the most difficult. The screen is little more than a static drawing of these environments. While you can simply look around for signs of activity, navigate the map, use a pair of binoculars for a closer look, or try to lure deer using attractant scent, a call, or antler rattle, most of what players do is patiently wait for a chance to shoot at deer and avoid being upwind so deer do not pick up the hunter's scent and flee. The larger the deer, the more points players are assigned and as a testament to players' prowess, the heads of the animals can be mounted for display in a virtual trophy room.

In an industry that continued to pride itself on highly innovative, complex games that utilized state-of-the-art technology, there was much to criticize in Deer Hunter. The game clearly needed 3D acceleration and better graphics; The interface was considered jerky; Aiming is difficult; the AI is adequate at best; and the replay value is low, but as far as a hunting simulation, there had never been anything like it on the market and its sales were virtually unstoppable. Hunters in particular could not get enough of the game. They felt it accurately captured the look and feel of hunting deer, and that the ambient audio was appealing and realistic.

Many reviewers admitted to the game being surprisingly high on the "fun" factor and having more strategy than expected, although for gamers who were non-hunters, the replay value was extremely low. Deer Hunter does not require a state-of-the-art machine and to the surprise of many, not only was the interface mouse-driven, but the help menu was actually helpful even to beginners, and the game actually fit on a single disc. Installation of the game, choosing options, and getting started are all remarkably simple processes. Perhaps also playing a part in

Deer Hunter's popularity were the advantages of cyberhunting: No license, no mess, no discomforts, no risk, and no guilt.

At $19.99, Deer Hunter cost less than half of the price of most new computer games and less than a third of the price of the expensive games. Winters (1999)[42] makes a strong case for the "familiar" and the "understandable" in retail purchasing decisions, so some of Deer Hunter's appeal to mainstream America may have resulted because they understood and connected with what they saw on the cover of the box. Leveraging off the momentum created, its $9.99 add-on package "Deer Hunter: Extended Season" rocketed to the number 2 spot on the PC game charts when it was released. Extended Season offered 3 more landscapes, a map editor which gives the ability to create your own hunting area, an additional rifle, and twice as many deer.

Although built on an extremely simple premise, product cannibalization is high in this product family. A total of five games were released between 1997 and 2001, ending with 'Deer Hunter 5: Tracking Trophies. After Atari acquired the rights to the title, it switched to a naming convention involving the year instead, beginning with Deer Hunter 2003, and has continued annual releases of the title. In spite of these sequels, on the heels of Deer Hunter, WizardWorks launched another hunting simulation called Rocky Mountain Trophy Hunter, which is graphically superior to Deer Hunter, but otherwise the same game.

The franchise, by 2003, had reportedly sold 10 million copies. Deer Hunter was the 2nd highest selling PC title in terms of the number of units sold per year in 1998 with revenues of approximately $10.5 million. Its expansion pack that launched in February 1998, Deer Hunter: Extended Season, was rated 19th in top unit sales for that same year, bringing in an additional $2.5 million. As a point of reference, Quake II was rated 17th for that same year in the PC games category with annual sales of less than half and a price tag of 2.5 times as much. In the

---

[42] http://www.gamasutra.com/features/19990305/winters_01.htm

following year, the hunting games parody known as Deer Avenger from Simon and Schuster, in which the deer hunts the hunter, was ranked 9th on the PC games charts, while Deer Hunter II held the 16th and Deer Hunter III held the 17th ranks.

The team behind the title was quite well-aligned with Walmart's goals, but neither the developer nor the publisher remains in business today.

- Deer Hunter's developer, Sunstorm Interactive, was founded in 1995 and specialized in shooter titles in the value ($20 and $30) games software market. Despite the incredible success of Deer Hunter and its long line of sequels, Sunstorm's failure became public record in early 2003, when the firm closed its doors, citing financial and staffing difficulties.

- The game's publisher, Wizardworks, specialized in titles for discount merchants including Target and Wal-Mart. The firm was acquired by GT Interactive, then by Infogrames and held its WizardWorks label until Infogrames became Atari. In 2004, Atari closed the original Wizardworks offices in Minneapolis and moved projects to Atari's offices in Massachusetts.

Ultimately, a rather colorful quote from Game Revolution may best sum up insider and hardcore gamer opinion on Deer Hunter's impact:

"It all started deep within the bowels of the chain of suburban super-stores called WalMart. A game unlike anything ever seen before was unleashed upon the public: Deer Hunter. The innocent consumers were taken by surprise as mass mind-control forced them to pull out their wallets and eat up warehouses full of the game. Then came the horror of Deer Hunter: Extended Season. Picking up where it's predecessor left off, this evil spawn mercilessly slaughtered the competition and left the gaming industry in a state of confusion and panic. It wasn't a pretty sight....This is definitely not Quake; and that's probably why these games have had such success."

7.3   Manifestations of Hypotheses in the Cases

In all cases, there is strong support from all 3 cases in this chapter that different customers should be integrated, depending on the type of innovation undertaken by the firm. Further, the case study findings aligns well with prior academic work on the benefits from involving lead users in radical innovation.

Quake, in the purest sense, is the flagship product from an entire product family that appeals to and specifically targeted the hardcore gamer. It was highly focused on delivering radical innovation, and to that end the team at id Software had many mechanisms in place to involve, and engage lead users. Hardcore gamers were included in feedback loops that connected back to development and were also heavily utilized during testing. id supported innovation by lead users through an Open Source type of approach: its release of code encouraging mod creation as well as through technical support. Licensees of id's engine were also required to share any resulting innovation relating to the technology from their efforts, as part of their agreement with the firm.

There was no evidence of integrating the casual gamer in id's strategy. Management appeared to be very clear that this user was not Quake's target customer, nor would casual gamers have had much basis for understanding and appreciating the title's creative contribution. Game difficulty, hardware requirements, and set up would have clearly been additional barriers.

Another explorative venture, The Sims, also integrated hardcore gamers' opinions during development. As noted, hardcore gamers were instrumental in getting the product to the audience of female and casual gamers and provided critical feedback during testing. Ironically, it was this (lead user) feedback that changed the focus of the game from architecture to the characters, which ultimately made the game less appealing to the hardcore audience yet made it commercially successful by growing its appeal to its target audience, within the female and

casual markets. The Sims is an enlightening example in which lead users played a role in promoting radical innovation although the end product was not of direct interest to them. The Sims is considered a highly creative game by any measure and a genre breakthrough, so it is unclear whether the average user might have made the same sort of contribution to the success of The Sims. The literature informs us that conventional marketing techniques fall short of being able to manage more explorative innovation and the average user lacks the proper frame of reference to properly evaluate the innovation (Lynn, Morone, & Paulson, 1996).

The Sunstorm-WizardWorks team responded to the needs of their channel partner, Walmart, with a simple, low-cost product that was based on existing technology and tailored specifically to the needs and interests of Walmart's customers who were expected to be first-time and casual gamers. Exploiting the hunting genre, Deer Hunter's contribution was ultimately a more realistic experience that was immediately appealing to hunters, but also a simpler gaming experience to draw in casual gamers. By being value-priced it lowered the risk of trial and dissonance for users. Hardcore gamers were not involved in any way with the development of this product, which relied on Walmart's customer research utilizing familiar feedback tools and mechanisms. The integration of casual gamer opinions in this case was completed through the normal market research mechanisms and persistence of a Walmart executive who knew his firm's customers intimately.

Excessive reliance on lead user guidance can be detrimental, based on the case study findings. Quite clearly, if the team at Sunstorm and Wizardworks had involved the hardcore gamer in development or agreed with others in the industry that the idea for the game that Westmoreland was trying to sell was "ridiculous" and refused any part of it, Deer Hunter would never have come into being or its success would not have been realized in quite the same way. Although hardcore gamers scoffed at the title, we have to assume they were mystified by its

success, for even Deer Hunter's programmer, James Boer, admits to its sales being "a shock to everyone, including us" (Boer, 1999).

Although hardcore gamers played a significant role in the development of the original Sims title, to successfully exploit the product via sequels and expansion packs, Maxis has largely depended on feedback from their target audience of female and casual user segments, utilizing more traditional, rather than lead user mechanisms. In fact, Maxis-EA partly attributes the relatively poor performance of The Sims Online to not listening closely enough to their target segment (Lewis, 2003). The Sims Online was modified, post-launch, largely based on the feedback from its critical, target segments after it became clear that the title was not tracking to the kind of success expected of it. In addition to extensive market research, teams at Maxis and Electronic Arts almost perpetually monitor Sims communities for feedback and innovation. Although there are only so many modifications that the game will allow, these include checks for potential problems caused by hardcore gamers tinkering with the code for sport.

The case of Quake is not applicable to this hypothesis. Quake's strategy of deliberately targeting lead users cannot be considered *excessive reliance*, nor is the type of innovation id is focused upon considered truly exploitative. Hardcore gamers appear to agree that Quake II was a sequel to Quake in name only and with the exception of the expansion sets, the games in the Quake product family are remarkable enough, and independent enough to be individual successes.

In short, all three game producers involved users in their strategies to design games and their sequels, however, the industry's perception of "the users of importance" makes a difference, and a careful understanding of who is likely to be the user is key. We can infer that lead user or hardcore gamer involvement in development of The Sims' follow-on products and definitely in the development of Deer Hunter, both dealing with incremental innovation, may

have had potentially disastrous effects on the performance of these products. In fact, with greater recognition of the opportunity represented by the casual gamer, games industry publications contain numerous references to negative repercussions from mistakenly or accidentally involving hardcore gamers' opinions in a game's development and the firm's strategy. While hardcore gamers face no issues with regards to conceptualization or familiarity when it comes to exploitative products, they may be needlessly biased by their high need for creativity and low appreciation of exploitative products that appeal to the causal segment. This, coupled with the fact that hardcore gamers are high on self-expression and can easily dominate a community with their opinions, adds substance to the proposition that when it comes to more exploitative business models, hardcore gamers could be capable of leading firms astray.

7.3a   Manifestation of Hypothesis I

That hardcore gamers prefer to be aligned with creators perceived as creative is a clear finding from the cases. From the case of id Software in particular, we can see how a firm perceived to be of *indie* status can garner tremendous support from the hardcore community that they motivated to organize and in their actions, such as the birth of QuakeCon, can exist reasons for the family's relevance longevity. That the perception of id's independence has continued despite the firm's subsequent association with large, mainstream publisher Activision allows us insight into how that this labeling can be derived from a perceived and reputational element, as much as it can be simply factual (i.e. being labeled *indie* purely due to the method of financial backing). The active association of John Carmack in id's strategy and in product development along with his maverick style no doubt also has a role in this perception.

7.3b   Manifestation of Hypothesis II and III

Inferring that H2 and H3 was manifested in the cases is more inconclusive. Betweenness Centrality, that H2 references, requires social network analysis techniques, and for H3, I apply these same techniques to make the case that there may be different human capital or skills requirements between those that drive lead user interest and those that develop successful product families.

Having said that, the two most successful franchises of the three cases, The Sims and Quake, have highly central and visible creators in Sims' designer and cofounder of Maxis, Will Wright, and Quake's programmer and founder of id Software, John Carmack. Although there has been some newsworthy departures over the years, for the most part, both firms have a history of employee retention and their connectedness to two of the largest publishers, Electronic Arts and Activision respectively, further bolsters their suggested centrality and therefore permits access to the knowledge of the individual contributors behind the titles, who might have otherwise be quite insulated as is usually the case of *indie* developers.

Both Wright and Carmack are each recognized as an important element of success in replicating the business formula behind the The Sims and Quake product families, and each has played a key role in the development of these franchises, as have other members from their supporting team. The presence of these people on the product development team, and later, as part of the branding effort should be considered a difficult-to-imitate knowledge asset, that establishes a competitive advantage for Maxis-EA and id Software-Activision. Quite simply, by these games being affiliated to well-connected, highly central creators within the network of high performers, the games are placed in an advantageous and unique position with regards to knowledge access: We can assume that in access to these creators' knowledge, lies access to any

standards or formula for success from the creators' prior experience, that should have been available during the creation of the game.

To gain greater insights into centrality, I attempted to examine differences via social network analysis, between key creators such as Carmack and Wright, and their associated teams expecting to find noteworthy results as id Software creates games of significant hardcore gamer interest, while Maxis-EA does not. At a somewhat higher level than I had hoped, I can conclude that Wright and several key members of The Sims team are prominent in the Density Centrality measure, while Carmack is not at all. In the social network analysis at the level of creator, I found both Wright and Carmack rank high in terms of Betweenness Centrality, which was not surprising as they play an important intermediary role of linking the large firms Activision and Electronic Arts to the independent developer community. However, the differences I uncovered are not substantial enough to warrant any conclusions. To complicate matters, id Software has had notable changes to its core team, especially with the departure of designer John Romero, while the Maxis team has grown frighteningly large, based on Wright's description delivered at the 2004 Game Developer Conference (GDC), perhaps even enabling the aforementioned *Matthew effect* in terms of Wright's own centrality. Clearly, to properly evaluate this hypotheses, empirical evidence that takes the entire project team behind the games, not just a single creator into consideration, is necessary.

The small team of Deer Hunter's creators had not had much experience in games software before the release of the title. According to the database at Mobygames, only one of them has worked for Activision THQ and Bandai since, and both developer and publisher are no longer in business today, so it is not surprising that its creators are not central by any measure of centrality. My data shows that Atari has employed one other member of the Deer Hunter team

on other titles, but those titles themselves have not performed well by industry standards so are relatively unknown.

Neither can we say that Deer Hunter's contribution to setting up its product family for success has been prominent. Deer Hunter, Deer Hunter 2, and its expansion set were on the top selling charts in 1998, but its first two sequels made a modest showing with 260,000 and 257,000 units a piece in 1999 and have disappeared completely from the charts since. Furthermore, since technology in the game's sequels was updated, the cost of development has risen considerably over the period since 1997, the price of the follow-on products remained essentially the same, and demand for the products has fallen, we have to assume that this does not signal successful performance.

7.3c Manifestation of Hypothesis IV

H4 also requires empirical backing to truly bottom it out. What we can say from the case analyses is that we can infer that lead users are highly identity driven, so preferentially attach to highly innovative products. The case studies also suggest that unless there is underlying creativity for each follow-on product; as management begins to add other products such as sequels and expansions or as product development becomes more exploitative and heavily commercialized, lead users' interest potentially diminishes. Any involvement by hardcore gamers during the exploitative stage of the product family's lifecycle appears to be for sport or to stay updated rather than any true interest, making it even more important that their opinions be weeded out.

As The Sims has become further entrenched in an exploitative model, it has become more removed from the hardcore gamer community. Although Will Wright is highly revered for his creativity, we can argue that hardcore gamers had little if any interest in the original title, so an

inverse relationship is certainly possible. After several interviews I conducted within EA, it remained unclear whether the poor performance of the Sims Online had anything to do with mistakenly or purposely including hardcore gamers' opinions in decisions surrounding the game's development. The staggering hardware requirements, and the need for users to innovate and participate in the community to make the experience of the Sims Online were strangely reminiscent of a different, hardcore gamer audience, and this may very well be why the game was not successful with its target audience of female and casual gamers.

There also seems to be clear indication, especially from message boards and other community-based services that facilitate chatting or other means for the exchange of opinions, that hardcore gamers are quite impatient with "sequelization" in the industry and see it as a sign of low innovation and risk aversion. While they may have appreciated the innovation behind The Sims, as more expansion packs came into being and the game became more commercialized, the hardcore gamer's interest seemingly became relegated to ways to torture The Sims and infiltrate the code if anything, but not really to play the game as intended.

Quake's sequels are not regarded as true sequels because of the departures from theme and technology taken by its successors and although there have been many mods, the number of official additions to its product family at only 2, has been far less than The Sims.

Since hardcore gamers had no interest in Deer Hunter to begin with, there are no real insights that have to do with H4 from that case study.

From the results, H4 is manifested a bit more strongly in the cases, but ultimately, since case studies cannot be used to test hypotheses, greater rigor and a statistical basis, more along the lines of the earlier quantitative analysis, are clearly necessary.

CHAPTER VIII: DISCUSSION

It is the totality of these findings, rather than reliance upon a single variable that indicates that this dataset largely measures hardcore gamers. For example, a preference for high technological quality alone does not indicate lead usage. It is quite intuitive that highly unique or memorable games should stand apart, by virtue of some aspect of their superior quality, as assessed by users and/or reviewers. Consumers' quality perception of a motion picture has been linked to its success, likely via positive word-of-mouth (Austin, 1989; Neelamegham & Chintagunta, 1999), and more generally, product quality has been recorded as a predictor of innovation success (Roure & Keeley, 1990). The opinion of professionals via awards and critic ratings are also likely to produce a similar effect (Litman, 1983; Nelson, Donihue, Wladman & Wheaton, 2001), although awards are not very well established in the interactive entertainment industry and were therefore not studied in this work.

Exhibit VIII-a: Synopsis of Findings for Statistical Study

Variable	Models 1 & 2	Model 3	Model 4	Model 5	Model 6	Model 7
Recent Launch	+++	+++	+++	+++	+++	+++
Video game (vs. PC)						+
Superior Relevance	++	+++	++	+++	+++	+++
Game Quality	+++	+++	+++	+++	+++	+++
Non-Mainstream Genre	+++	+++	+++	+++	+++	+++
Game Difficulty	+++	+++	+++	+++	++	+
Reputation as Independent		++			++	
Central Game Creator			+++		+++	+++
Products in Family				---	-	-
Recent Launch for Independents						--

Even from the performance of the control variables there are indicators that this user population differs from what we may expect from the casual gamer: 1) Game difficulty (DIFICLTY) has a positive, strongly significant relationship to INTEREST ($p < 0.05$). Games with mass-market appeal tend to be those with low to moderate difficulty ratings and a focus on simplicity (Adams, 2000; Edwards, 2005). 2) Relative to the referent category of RPG (Role Playing Game), Strategy and Simulation, Adventure, or Miscellaneous (e.g. hybrids), the more commercial genres of sport, driving, racing and action are significantly disadvantaged ($p < 0.01$). 3) Original content is probably preferred to franchises or licensed titles, and we have a highly significant and positive relationship with INTEREST and both game quality as assessed by expert reviewers as well as the longevity of a game's relevance at point of sale. Games that have demonstrated more relevance longevity by being iteratively successful as top games are of greater interest. 4) Compared to the most recent year of the study, games launched in other years are at a disadvantage, with the disadvantage generally decreasing with recency, implying a recency bias as should be expected of this community. 5) The recency bias reverses into a primacy effect for games from independents, that are of greater collectible interest and creativity.

Exhibit VIII-b: Results of Hypotheses Tests

Label	Description	Results
H1	Products whose creators are perceived as independent will be of significantly greater interest to lead users than products whose creators are perceived as non-independent.	Strong Support
H2	The Betweenness centrality of a product's creators will be significant and positively related to lead user interest in the product.	Highly Significant Support
H3	The human capital (or skills) requirements for driving lead user interest, are different from those that are significant to developing successful product families.	Some support. Further study required.
H4	Lead user interest in a product will have a significant and inverse relationship with the number of follow-on products from its family.	Supported.

8.1 Of Lead User Engagement

Without pre-existing mechanisms to engage and draw in lead users, the tasks of identifying them, deconstructing their needs, and creating an environment which enables the feedback loops the literature advocates as beneficial, can be an enormous undertaking.

To encourage the organization of a lead user community in the games software industry not only takes the development of high-quality products, and well-respected creators, but also producer-established online customer communities[43]. The resources to create, serve, and manage these communities are usually extensive beyond some minimum level of product sales and membership. Also, given the high expertise of lead users, producer-employed community managers need to be of like expertise in order to field questions and offer proper support. We have empirical justification in this study that lead users' perception of producers' identity is an important driver of their interest and unless this aspect is managed properly, risks taken with reputation and product line may become potential costs. Quite simply, because lead users can be extremely influential and vocal in user communities, firms that do not fulfill their high expectations may be at risk of poor performance in the market or damage to their reputations.

Into the product, at the development level, considerable forethought is required to enable users to modify and extend the product, and to innovate via user toolkits (von Hippel, 2001), maps (Jeppesen & Molin, 2003), and other producer-supplied vehicles that are designed to inspire user creativity and innovation. Quakecon gives an appreciation for the sort of mobilization of resources that lead users are capable of in games software, but supplying the lead user community with tools and assisting them at least initially in the learning process may be firm responsibilities, especially in the absence of an already established user community. The

---

[43] Data from Jeppesen (2002) confirms that 83 percent of computer games products offer producer-established online communities and 35 percent offer both communities and user toolkits.

unique knowledge of lead users can move them into product spaces that lie beyond the bounded rationality of firms and if solution spaces (von Hippel, 2001; 2005) or technical limits are too confining, the resultant innovation may be stifled.

Push strategies to convince lead users to partner with organizations can be an ongoing costly and effortful venture even for firms like Apple Computer, that largely succeeds in engaging and motivating its lead user community. In spite of massive community-level development, Apple nevertheless has a division devoted to worldwide developer management so that relationships, communication, technological exchange and the resultant innovation can be managed and protected. Readers may gain an appreciation for the magnitude of this effort via Apple's corporate website[44]. Developer resources include training, seminars, support, and a wealth of information resources including competitive intelligence.

Not all lead users want to share their knowledge (Lüthje and Herstatt, 2004; von Hippel, 2005), and although pure monetary rewards are not thought to be drivers, the planning and administration of incentives may nevertheless be costly, and are probably orchestrated around some mix of peer recognition, reputation, network effects, product improvements and product availability (Franke & von Hippel, 2003; Lüthje, 2003; Lakhani & Wolf, 2005; Henkel & Thies, 2003; von Hippel, 2005). The access to exclusivity and obtaining the commercialized product ahead of the market have also been shown to be motivators for lead users, especially in the industrial market (Brockhoff, 2003).

Organizing resources to appear more aligned with and therefore attractive to lead users potentially enables firms to reduce the costs and effort it otherwise takes to engage them. We can confirm as a result of this study that products created by entities perceived to mirror lead

---

[44] http://developer.apple.com/

users' identities as unique innovation-producers are at an advantage and that producers' reputation and positioning and social space are highly significant drivers in this regard.

First, applying lessons from the history of the Hollywood studios and the role that independent films played in endowing the industry with creativity and originality, I have argued and empirically confirmed the importance of the reputation of creators; specifically that titles created by producers perceived to be independent of the status quo are of significantly more interest to hardcore gamers than those considered mainstream. I have inferred that in the notion of independence is a proxy for innovativeness that is a sense of being removed from mainstream production that involves more commercialized, conventional products. Organizations that can acquire the appropriate resources so their products or the creators of their products more closely emulate lead users' sense of unique identity as the literature on preferential attachment and homophily implies, are therefore more likely to engage these users as partners.

The year in which a game is launched significantly moderates reputation. However, one of the more surprising findings of this study is that specifically for games launched by independents there is not a recency, but a primacy effect that is strongly significant. Games from independents are well represented in recent years among the top games in this study, however earlier games from independents in particular are of more interest to lead users. This finding may indicate what is known already: That hardcore gamers have an appreciation of the classics and we already know that many of them have a sizeable library of collectible type of games. It is common knowledge that they return to playing the high quality, innovative older games for nostalgic reasons and also to demonstrate prior knowledge and breadth of knowledge. Alternatively we can interpret the finding to mean that short retail relevance is a more recent phenomenon. Games in earlier years may have had more lasting success on average due to the relatively smaller number of choices available to users, so top games had a greater chance to

stand out and capture mindshare, which contributes to their greater memorability today. Finally, a more bleak interpretation could be that the independents in more recent years are just not creating games that are as innovative or at least as memorable as the ones they have developed in earlier years. Whether this has anything to do with their partnerships with more mainstream firms or consolidation remains to be seen.

Second, lead users' preferential attachment is not just on the basis of a reputation for innovation, but also appears to have something to do with creators positioning in social space. I have shown that products whose creators lie in central positions, not because of a high number of ties to other successful performers, but as a result of non-redundant ties that link distant parts of the network of high performing games are at a significant advantage in driving lead user interest, and I raise the issue of whether this may have something to do with highly-specialized or unique knowledge possessed by these creators due to their positions as intermediaries. We can argue that successful, mainstream creators have access to knowledge pertaining to how to create economically successful games; and that independent producers have access to knowledge regarding how to create innovative games; so perhaps commercially successful, independent producers have the very unique knowledge pertaining to both exploitation and exploration (March, 1991), that Tushman and O'Reilly (1996) have referred to as ambidexterity.

The impact of centrality is especially pertinent in this particular study as I consider network resources from top-selling games, whose creators are more likely to be discussed in forums and known by gamers. From a knowledge-access standpoint, Betweenness Centrality is a measure that can help indicate the propensity for games to employ unique and in-demand skills that bridge distant parts of a high-performing network and may be an integral part of the knowledge necesssary to make games that are both commercially successful and innovative. To the extent creators are seen as innovative, the literature predicts that the rated radicalness of

innovation, and therefore overall uniqueness of the product, should be higher (West & Anderson, 1996). Theoretically, top games that are more central as a result of having well-connected creators should benefit from a Matthew effect[45]: That is, the more well-known the creators of a game, the more likely that there will be discussion of the title within user communities, and other gamer activity, such as additions to wish-lists, purchases, searches, as well as online information requests pertaining to the game, which in turn should positively impact its INTEREST score.

Since a network form of organization brings most products to market, we could infer that the possibility to manipulate the overall effect of reputation in the video games industry may exist, and as such, this study has implications for strategic management in firms of varying size and profile. Games from independent producers have at least two notable differences, based on the empirical findings, and in particular the interactions studied: The first is with regards to the year of a game's release, discussed earlier in this chapter, and the second has to do with Betweeness Centrality. Given these findings as well as my own knowledge of the industry, I make the case that there may be ways to set up partnerships and manipulate reputation so that mainstream firms appear more independent and vice versa, provided management determines that lead users are important to strategy.

The moderately significant interaction between creators' reputations as independents and their status as intermediaries is worth mentioning as a caution on one hand and an opportunity on the other, given this discussion. While the extent to which a product's creators are intermediaries, as measured by their Betweeness Centrality, shares a positive, highly significant association with lead user interest, for independents this reverses into a weakness. Independents are traditionally thought of as outliers, and this peripheral positioning outside the status quo and away from the influences of commercialization may be essential to lead users' belief in these

---

[45] Unto every one that hath shall be given, and he shall have abundance; but from him that hath not shall be taken away even that which he hath" (Matthew 25:29)

producers' ability to nurture and preserve their innovativeness. On the other hand, we would probably expect successful mainstream producers to occupy central network positions in a more traditional sense, as represented by Degree Centrality or their quantity of ties. As the costs of development continue to escalate in games software, there have been ongoing debates at the major industry conferences I have attended over the past 4 years on the viability of the indie business model. The reality seems to be producers need to either hold costs aggressively in check, which may not be a possibility given technological change and cost; or to forge a partnership with financially stable, more mainstream producers. If structured correctly, with the appropriate autonomy in place as id Software-Activision or even Maxis-EA to some degree has experienced, innovation may thrive but the reality is that these arrangements are in the minority. The results of the Betweeness Centrality and Independent interaction may suggest that lead users are inherently skeptical that a true balance between producers' artistic and economic objectives can be obtained at all. As such, independents who forge this link may risk being thought of as compromising their innovativeness and "selling out" to commercialization and pure profits.

In this industry, organizational identity (or image) is spread across partners and consumer perceptions about whom to hold accountable for purchases, can be ambiguous. Although the concept of organizational identity does exist in these *quasi* firm environments, the relative malleability of that identity should be considered, especially for organizations participating in greater levels of interfirm collaboration. For example, collaborative arrangements to bring a product to market could result in bolstering one partner's negative organizational image by the addition of a partner with a positive image, whose image may consequently be diluted. I argue that Jensen's (1992) discussion of "halo" and "black-eye" effects from a multi-product environment is applicable here as well. Through the formation of key partnerships with independent, innovation-producers and via product development and product diversification

strategies, firms that have reputations of being larger and more mainstream, such as Microsoft are still capable of appearing more independent and innovative. Microsoft is a relatively new entrant into console gaming yet had a reputation for creativity with the MS Flight Simulator series for many years prior in the PC gaming space, which has always been a part of the hardcore gamer's repertoire. With the purchase of independent developer Bungie, its product Halo, which became a platform-defining title for the XBox console, was coded as having independent creators.

Product strategies must be backed by high clarity of vision and flawless execution by management so the appropriate balance is achieved between the organization's rent-generation and innovation goals. Under product portfolio diversification, highly innovative, experimental products for advanced users can be added to the firm's portfolio to retain ties with hardcore gamers and encourage innovation. The enormity of this effort should not be underestimated given the standards of hardcore gamers, so an alternative is to treat these strategic products as part of the firm's research and development, rather than a shorter term rent-generation effort. Other strategies specified in the literature such as building advanced usage into the existing product line; and supporting the lead user community through user toolkits, seminars, exhibitions, testing and the like, are also assumed to be important in creating and preserving a reputation as an innovation-producer.

8.2 Of the Limitations to Lead User Importance

We can conclude with a reasonable amount of confidence that lead users dominate some environments and not others, and that even in an industry dominated by lead users, there may be circumstances in which firms ought not to ascribe them undue, or potentially even any, importance in formulating and executing strategy. First, a firm's vision and strategy may dictate

that focusing on another type of user may be more important, but so also is the lead user. Second, it may be that following lead users, even inadvertently, may result in disastrous consequences to performance because target users' needs may be directly at odds with those of lead users.

A simple illustration involves the different approaches to game design, that cater to different users' preferences. For hardcore gamers, competitive play is at the core of their gaming experience, so it is easy to see why the most recently introduced, most powerful hardware is important to this group, as often also is the ability to connect with others to play. That is, competing with and against others, which could include the game itself, and a clear set of objectives to win or conclude play are traditionally what hardcore gamers have been drawn to, so game designers spend endless hours figuring out the nuances of balancing, core mechanics, and the like, all of which are essentially about problems relating to competitive play. Hardcore gamers also innovate, not only for the pure joy of creation or extending the game in some way, but also to acquire play-based advantages. Developers like id Software know that to attract the hardcore gamer, have him buy the product, continue playing so that his friends will join in as well, have him buy the sequel, and even innovate, takes both style and substance considerations. Between the two, however, substance considerations are by far the more important to lead users, truly determining their attachment to a game or eventually its product family. Substance results from a novel experience, challenging and alluring gameplay, high replay value, and clear objectives.

On the other hand, creative play emphasizes the style of a game, fun, and exploration, with a sense of "Look-I made that" (Adams, 2005) rather than winning, clear objectives, or an "end configuration to be achieved after which the game stops" (Wikipedia, 2006). The Sims is such a case, in which self-expression and open-ended play rather than competition and

performance optimization, are emphasized. Creative games have not received much attention due to the industry's high focus on the hardcore gamer, but they are becoming important as the market grows beyond this lead user (Adams, 2005). Although creative tools are already encouraged in a variety of casual market titles to help players customize and own the game in a psychological sense, this is not the same thing as total conversions that are popular in the hardcore gamer community and affect the original game in a very tangible sense.

As noted in the case study, Quake allows mods and id Software went so far as to release the engine's source code to encourage innovation by lead users. The Open Source effort in games software is ongoing and continues to gain momentum, however, many firms still prefer to provide toolkits and impose limits on the user development that is possible, as noted in several points in the thesis. One example of this approach is Microsoft's XNA strategy claims to "democratize game development" by enabling consumers to become game creators on Windows and XBox 360 using Game Studio Express. Another is The Sims, which allows changes in some aspects of the game, such as adding new clothes, but not in others such as characters' occupation or skills. Creative tools in The Sims include objects to set up mini-games for contests, businesses, and so on (Lewis, 2003).

Firms need to make difficult decisions with regards to their intended audience and what role, if any, the lead user might play in this process. We can envision as a result of this study that mistakenly or purposely including hardcore gamers' preferences in exploitative product development strategies can have potentially disastrous consequences on firm strategy and resultant product family performance. Doing so during the development of Deer Hunter would have surely resulted in drastically different results, and we might envision at least 2 types of failure: The project might have become a non-starter, or the game may have considerably

changed its form and in the process jeopardized its appeal to Walmart's customers and the casual, hunter market.

Using the notion of the product family, we are able to study the effects of lead users on incremental innovation in a more structured sense. We have established an empirical basis for the idea that products that are entrenched in the product family model, or alternatively, as they support a greater library of follow-on titles, they are of negative interest to lead users. This suggests that firms developing products that exploit known franchises and technology should particularly be mindful and exercise a great deal of caution in relying upon the opinions of lead users. Based on the results of this thesis, there an empirical basis for different customer integration, depending on whether the product development under consideration is exploitative or explorative.

The confirmation that the interest of a hardcore gamer has an inverse relationship with the number of products added to the franchise makes a case for deliberately screening out lead users in feedback loops, testing, and other integration involving exploitative products and models like the traditional product family model. An inherent bias may exist in lead users' opinions of exploitation, as Frank Bass (1969) points out in his early, seminal discussion of innovators versus imitators: Unlike imitators, innovators are "venturesome and daring" and for them the pressure to adopt "does not increase with the growth of the adoption process" and in fact, "quite the opposite may be true" (Bass, 1969). While products that have successfully contributed to the development of a product family are highly appealing to the community of casual gamers, this very appeal may elicit a lower association with originality and creativity for hardcore gamers, and therefore may be a driver for their lack of interest.

Smaller firms that are resource-strapped may find themselves needing to choose between the two user markets: Those firms pursuing the hardcore gamer may find they have alienated the

casual gamer market, and doing so may prevent their products from attaining top-rank status, which is a highly risky strategy in the interactive entertainment industry. As noted earlier, given soaring development costs, it is commonly accepted that most firms need to sell 1 million or more units of each game they launch to be successful, and this sort of sales record was only possible for the top 10 highest-ranking games during the period of the study. Companies that opt out of the casual game, mass-market may have to control costs tightly, and this is a near-impossible task given the huge emphasis on technology and realism today, and the unusually high standards of hardcore gamers. Hardcore gamers tend to play games over long sessions for the exhilaration of finishing or beating the game; are less likely to abandon a game out of frustration arising from difficulty of play; and prefer games of depth and complexity (Adams, 2000; Kim, 2001; Ip & Adams, 2002). Making games with high appeal to this market clearly requires highly involved, state-of-the-art development.

An alternate strategy is to design products exclusively for the casual gamer market and ignore the more advanced needs of hardcore gamers. However, this approach may also result in forfeiture of top-sales ranking. Drawing criticism from the hardcore gamer community may adversely affect product sales and the non-inclusion of these opinion leaders may not give the product the needed bandwagon effect necessary to draw in the mass market.

Using clever strategies that do not involve, nor offend the hardcore gamer, smaller firms can establish a presence in the $350 million casual games market which is expected by 2008, to grow to $1 billion, according to Jupiter Research (Gartenberg, 2003). Additionally, the Entertainment Software Association claims the 56 million worldwide casual gamers today are projected to increase to 80 million in 5 years. Due to the relative simplicity of casual games and the possibility of web distribution, development costs may be held down to an estimated $50,000 compared to $20 million for the games currently being sold at retail (Edwards, 2005).

Ultimately, the response to "Where's the pain?" in the games software industry often comes down to a discussion of the need for strategies to extend retail relevance, and producers' relationship with the hardcore gamer. If a product extension has capitalized on the window of opportunity created by its predecessors and achieved superior performance contribution by enabling a stream of products for the product family, we should expect it to be memorable either for some reason in and of itself (e.g. product quality, unprecedented sales) or that effort went into creating a support network for the product (e.g. web communities, complementary products) that has the effect of extending its relevance in the market. Using two highly *salient* games from the interactive entertainment industry, The Sims is an example of the first reason for ongoing user interest, and Magic: The Gathering, is an example of the second. If hardcore gamers are not directly interested in the product, their appreciation of it or at least their ability to ignore rather than attack it seems to matter.

Since quality ratings by independent reviewers are important to lead users here, and this has also been shown to be important in studies on box office receipts in the commercial film industry, we should expect that these ratings should likewise be important for exploitative products, such as those entrenched in product family models. With this logic, a case can be made for an ambidextrous (Tushman & O'Reilly, 1996; O'Reilly & Tushman, 2004) or combinative (Kogut & Zander, 1992) approach, that adds more explorative (March, 1991) change at critical points of what is fundamentally an exploitative strategy. More explorative changes to the underlying technology are sometimes essential to keep pace with changing consumer preferences, and consequentially, high rates of technological change and model variety are especially important to success in fast product cycle industries like games software. Meyer and Lopez (1995) discuss how the technological basis of a software product family, or the products' platform, can be extended either with the basic subsystem intact, or it can be renewed

or redesigned through successive generations of the product (Meyer & Utterback, 1993). Sanderson and Uzumeri (1995) show that in Sony's experience with the Walkman family, 85 percent of the changes it made were relatively cosmetic from one product to the next, and about 20-30 of the 250 product models it developed in the US during the 1980s involved incremental changes to design. However, all this activity rested on 4 major technical innovations.

In spite of the upside to be gained, there is concern in the games industry that the franchise or product-family model is being overused, to the detriment of original content or explorative innovation. In other words, the product family approach has important benefits that make it a strategically sound choice to manage product development in games software, but continuing to pursue extensions that add minor incremental changes is not a sustainable strategy. Although EA's strategy of launching annual sports titles such as the Madden NFL series is frowned upon by some insiders and it is occasionally accused of little more than roster changes to add in new players, there is no denying that the franchise is extremely successful, and this does not come from blindly relying on the brand. Electronic Arts is intimately familiar with the mass-market revenue potential of the sports genre, having dominated it for some time now, and having recently spun EA Sports into a separate brand. Games from EA Sports rely on an established development formula, yet utilize state-of-the-art technology and emphasize quality of gameplay[46] as well as graphics for every subsequent product extension, since realism and quality of gameplay are accepted by industry as important components of commercial success for the genre. More recently, even EA appears to be returning to its roots. The firm recently signaled the industry with Will Wright's Spore[47] in the offing, that innovation and original content are

---

[46] Gameplay is what the player experiences during interaction with the game, especially what the player does and how he/she enjoys that experience.
[47] http://www.businessweek.com/magazine/content/06_12/b3976086.htm

going to be important determinants of success in the future, so it will be doing its part to retain the interest of hardcore gamers and raise expectations of creativity in games software.

8.3   Other Implications of Centrality

We already know that centrality confers a network-based advantage that can grow stronger over time (Barabasi & Bonabeau, 2003) and that actors in central positions are usually in influential positions for resources, among them knowledge, and ongoing performance and influence. There is a predisposition towards celebrity in games software; the industry's lead users tend to know intricate details about games and their creators; and this is an environment in which *whom you know* is especially important for resources, signaling, and knowledge on vital industry-affecting events. Centrality within an elite member group, especially one that has to do with commercial performance as examined here, takes on even greater meaning.

Centrality in the context of my statistical study was applied by looking at the impact of the centrality of individual creators on an organization's strategy via the performance of its products, and performance itself was a non-traditional, (lead) user-based measure of interest for which established links to identity exist. Memorability is an important notion for products because within INTEREST should lie future market opportunity and therefore potentially, future performance. If circumstances permit the firm to identify the cause of the interest, a variety of strategies may be open to the firm to re-engage lead users and in doing so, potentially engage the market at large.

Clever hiring and retention strategies are clearly critical because they are different for different innovation strategies. Human capital experienced in creating top games seems to be universally important, but while high visibility creators with numerous connections are important to organizations wishing to pursue exploitation strategies; organizations wishing to engage the

lead user do not benefit from these types of skills that are usually confined to an organization or product family, and which would generally be expected to result in high Degree centrality scores. On the other hand, skills that are extremely unique or diverse, as a result of traversing both platforms and competitors are important to efforts involving lead users. To illustrate, I include the profiles of several individual creators with high centrality scores in Betweeness and Degree Centrality for examination in Appendix VII. A high Betweenness Centrality rating, as in the case of Jason Page and John Carmack appears to result from breadth: Connecting otherwise disparate parts of the network such as mobility between known competitors. A high Degree Centrality rating as illustrated by Joeyray Hall and Will Wright comes from depth: Working on a large number of titles, but in more of a local or product family sense, that has less to do with mobility between organizations. The profiles of Shigeru Miyamoto of Nintendo fame and James Boer, programmer on Deer Hunter have also been added as Exhibits in this appendix.

John Carmack is a central figure in games software in terms of celebrity and is practically an icon of independence and innovation. He is highly sought after for keynote talks and in the community of independents is a highly central figure in terms of popularity, influence and esteem, Carmack remains a bit of an enigma. He has the ability to maintain his maverick manner and high regard for quality to the point of perfectionism; disregard carefully orchestrated public relations milestones despite enormous commercial and financial pressures; and still deliver successful titles like Doom, Castle Wolfenstein, and Quake. Doom and Quake are among games cited as excessively violent and also the most creative[48] and it is well known that Carmack's work as lead programmer "has maximum leverage on the final product"[49]. In short, Carmack's self-image is clearly tied to id Software as well as to the products he has created, and id is cited as a model of ambidexterity (Tushman & O'Reilly, 1996; O'Reilly & Tushman, 2004)

---

[48] http://www.collectionscanada.ca/eppparchive/100/202/300/newmedia/1999/v14n20.txt
[49] http://archive.gamespy.com/gdc2004/carmack/index.shtml

for independent developers as they wrestle to find a balance between creative and commercial success. However, it is still important to place the games' performance in perspective, as it is a matter of degree: The fact is, PC Data held that by 1999 Doom had sold 2.9 million units since its release in 1994, and Quake had sold only 1.8 million units since 1996, when it was released.

id's ties to publisher Activision has placed Carmack in a very central position, but that centrality has a great deal to do with brokerage, quality of ties, or Betweenness because these ties link the network of independent developers to a large, mainstream firm. As noted earlier, most *indie* developers, even the successful ones, can remain somewhat insulated from mainstream performance.

No less influential is **Will Wright**, designer of The Sims and a speaker whose presentations few in the industry would consider missing. Although The Sims is Wright's greatest accomplishment and the game is not known for its technological prowess (Kelly, 2004)[50], nor is it particularly appealing to the hardcore gamer, this community nevertheless has deep respect for his work. As a founder of Maxis. and EA's most prized intellectual asset, Wright's positioning in a social network of commercial high performers is high by any measure of centrality. Wright may be confined to Maxis, but EA allows him and his team a great many liberties including access to its deep pockets and almost total creative freedom in return for the isolation, Wright's connection to EA and the burgeoning teams that have supported the development of his top performing titles place him in a truly unique and extremely powerful position, which may manifest itself as never before if his latest venture known as *Spore* proves to be as successful as the current hype suggests it will be.

Perhaps Wright's influence over hardcore gamers is best summed up in a comment from a developer at the 2005 Game Developer Conference: "I really don't play The Sims, but

---

[50] http://www.gamasutra.com/features/20041229/kelly_01.shtml

somebody told me I should be here"; Or from Diamante (2005)[51], who covered the event for Gamasutra: "They, along with hundreds other game developers were among the lucky few to witness something that had the audience gawking, laughing, hollering, and eventually out of their chairs in a sustained and raucous ovation…Regardless of whether one had an optimistic or cynical view of his methods or projects, everyone in the Game Developers Conference was marked with one of two feelings: elation for having been one of the lucky few to see something markedly different and exciting; or regret for being one of the unseeing masses. "

With the involvement of at least two highly central actors in games software, we can assume that The Sims and Quake development teams had access to these creators' prior knowledge in the absorptive capacity sense (Cohen & Levinthal, 1990), whether that was knowledge concerning standards or a formula for commercial success; knowledge about creative success that results in driving lead user interest; or both. Wright and Carmack are both recognized as critical elements in replicating success. They are difficult-to-imitate knowledge assets that establish a competitive advantage for Maxis-EA and id Software-Activision, and therefore also place the games they create in an advantageous position. Carmack and the team at id Software had already experienced success with their Doom title when Quake was released and Will Wright was already quite visible and influential in games software by the time The Sims was launched. Although designer John Romero left id in a fairly well publicized dispute, other key members of the id team and the team at Maxis grew, but nevertheless stayed together, so we can assume the core capabilities derived from the product family strategy that Meyer and Utterback (1992) argue in favor of, have had a chance to develop at both firms and that both firms invested in remembering what they knew (Argote, Beckman, & Epple, 1990) and built on that knowledge.

---

[51] http://www.gamasutra.com/gdc2005/features/20050315/postcard-diamante.htm

The pattern in games software seems to be that as product creators grow more central from the degree or number of their ties, we might make the case that the creator becomes more "commercialized" in terms of knowing the business formula for sales success. Centrality in this case may place the creator in an elite position to acquire industry knowledge, which may include hardware trends, competitive information, and the like, and therefore to contribute to successful brand franchise or family performance. At EA, this has certainly been true of the Madden NFL product family, in addition to The Sims.

From this work, we cannot say that lead users are averse to franchises. They may enjoy the familiarity of a known product family, as do casual gamers, but the nuances of this what this means need further examination. A moderately significant result from the FAMPRODS and PLATFORM interaction does indicate that the aversion to exploitation is significant for the console platform, which is unquestionably the more commercial and therefore the more exploited. PC games also have franchises, but the quality of the follow-on games from notable PC product families such as those produced by respected creator Blizzard Entertainment and Microsoft's Flight Simulator series have been kept high. Because lead user interest has an inverse relationship with the exploitation of franchises, we have to assume that some characteristics of games that are capable of launching heavily exploited franchises are uninteresting to lead users, or alternatively, there is a point at which exploitation appears excessive and the lead user loses interest, perhaps from excessive exposure to the game. It may also be that like Quake, the type of product family that appeals to lead users is not representative of typical exploitative models and each addition to the product family needs to be a powerful product contribution in its own right.

Particularly in an industry such as games software that does not rely on firm boundaries and long-term contractual agreements for production, individual creators of products may play

an important and ambidextrous role in the exploitation and the exploration of business opportunities. On one hand, those creators who are structurally positioned as intermediaries or knowledge brokers and are linked to non-redundant sources of knowledge (i.e. in sociological terminology, those who rank high on *betweeness centrality*) are important to successful creative and explorative performance. On the other hand, those creators with a large quantity of ties, who are highly connected in their local environment (i.e. those with high *degree centrality*) are those best positioned to extract or exploit existing knowledge and commercial value from the business.

8.4 Lead Users as a Distant Search Strategy

As a direct testament to lead users' importance to innovation, we have witnessed the power of a user-based effort through the Open Source Software story. There is some indication from this thesis that even in cases when the intended audience is not the lead user community, as with The Sims, lead users' involvement still appears to be important to explorative innovation. I propose it may be that lead users may be instrumental in the creation of a bandwagon or social contagion, or perhaps they are simply capable of recognizing when such an effect is likely.

Lead users may have a role to play in informing the debate on search, and more specifically, may offer a link to distant search mechanisms. Rivkin's (2000) discussion on complex strategies[52] in which he uses the analogy of rugged landscapes is particularly relevant here. Specifically, as complexity grows, the landscape facing the firm becomes more rugged, which is to say that the distance between the highest peaks increases, and there are an increasing number of local, lower peaks. It may be that lead users can differentiate not just between minima and maxima in a rugged landscape (Rivkin, 2000), but their links to distant search may allow them to identify local maxima from the highest of peaks: the sort that probably result in

---

[52] Complex strategies are defined by a high number of decisions and degree of interaction between them (Rivkin, 2000).

bandwagons. Since incremental change or exploitation (March, 1991), by its nature seeks local peaks, global peaks are attainable through distant search mechanisms, or possibly serendipity.

Lead users may be a form of distant search strategy, as a result of their innate ability to identify the trends and the opportunities of the future. Via access to the knowledge of these unique users, firms may be able to identify global peaks or at least avoid being "snared on low local peaks" (Rivkin, 2000). In the case of The Sims, although the game's intended audience was casual and female gamers, hardcore gamers were able to acknowledge the game's contribution and potential, provide critical feedback on what was really worth developing during the early stages of development, and withheld heavy criticism, thereby allowing the game to be successful, gather momentum, and incubate the franchise model.

On the other hand, Deer Hunter came under severe criticism from the hardcore gamer community and although the title and its follow-on pack were on the list of top-selling games, the subsequent games were little more than me-too titles. Because the concept of hunting deer cannot support annual improvements that for example Madden NFL can, with changing rosters of football players that give gamers a reason to buy a sequel each year, the changes to Deer Hunter are in background landscapes and incremental technological updates, engendering further attacks from hardcore gamers. The exit of its developer and publisher from the industry, one as a direct failure and the other as a result of an acquisition, should come as no small surprise.

To close this aspect of the discussion, I offer 2 caveats: First, while lead users appear to be connected to discovery of the highest peaks, it is not clear they can assist firms in avoiding the troughs or valleys. As we know, compared to exploitation, exploration (March, 1991) is the more risky strategy, but payoffs are potentially higher. Second, as this work suggests, with regards to exploitation, the value of lead users' guidance may be questionable.

8.5   ...and in Conclusion...

" When you are talking about a $10 billion plus industry, it can't and shouldn't re-invent itself every 5 years to be successful. It shouldn't be pummeled and then built back up. "

- Jack Tretton, EVP at SCEA

"Every game has to be a blockbuster of a student game. We have a flawed funding and distribution model!"

- Warren Spector, Game Developers RANT!

"But when we look at things now; when it takes man-months before a map gets to the playtest stage...I worry."

- John Carmack, GDC 2004 Keynote

"Iwata says he has the heart of a gamer. What poor bastard did he carve it from?"

- `Greg Costikyan, Game Developers RANT!

"It's become rather vogue to wring our hands about the lack of innovation ad the reliance on sequels and licensed content as a danger to our future. In fact, I helped launch this angst right here a year ago."

- Doug Lowenstein, 2004 E3 Keynote

"Software makers want games to be so realistic. But first and foremost they should evoke emotions"

- Shigeru Miyamoto, Nintendo

"So by the time 'Doom' rolled around, we really wanted to enable the user to make their own content, to make that easy as possible. Carmack's always had the Berkeley-like 'Information should be free' mantra."

- Tom Hall, id Software, co-founder

"We've dignified video games. It's okay to be 30 and to play video games."

- Andy House, EVP, SCEI.

"I was always impressed by the community that formed around 'Quake II' in particular. At some point the mod authors not only made new stuff for the game but also new tools for content ... a great example of how the hardcore fans can totally surprise you with their creativity, given the chance."

- Will Wright, co-founder of Maxis

"...the game industry is in such dire creative straits, turning out clone after tired FPS and RTS clone... If games that appeal to our "natural tendencies to be hunters" are the pinnacle of our industry, and if having an appreciation for dramatic interaction is "homosexual," color me gay and give me something other than the "pinnacle."

- Jessica Mulligan, Executive Producer, Turbine

CHAPTER IX: LIMITATIONS AND FUTURE RESEARCH DIRECTION

9.1 Major Limitations of the Thesis

The most significant of the limitations are discussed in this section, while a few more are introduced in the subsequent section, in the context of future research.

The limitation of most concern to this thesis lies in its generalizability. Games software is a unique and intricate environment, and its lead users may be equally different from those in other environments. Generalizability of these findings will be heightened in contexts where knowledge is accessed across fluid firm boundaries and non-traditional collaborative arrangements in fast-paced environments in which the power of the customer in the value chain is considerable. Nevertheless, as a high-technology industry that shares parallels with cultural industries, other fast-moving industries, and environments in which social networks are of critical importance, the implications of this study may also find multiple homes with potentially minor contextual adjustments.

A second limitation is an outgrowth of the enormous time and effort that went into collecting information pertaining to the game credits. As presented, this study could not be extended beyond 120 games without considerable effort and in particular, it was unclear whether the social network information for some titles is even obtainable, given the major organizational changes that have occurred since 1994, which was the year of the earliest product launch. Underlying this limitation is the lack of organization and standardization with regards to industry data. A variety of sources exist, most of which are not completely reliable and even those sources most frequently accessed for information by practitioners have problems and inconsistencies including those arising from the merger of research firms NPD and PC Data that researchers must understand in detail before using the data in any analysis.

Measuring user interest the way I have was attractive for its propensity to record interest based on actual user behavior measured by a reliable and popular source that is completely independent to this study, rather than user perceptions, but it was less controllable due to this very independence. In other words, for the gain of being able to study users as they face real-world influences, I gave up the sort of control one can achieve within the bounds of a well-orchestrated experiment. For instance, I used 2 independent sources and performed the checks already described to verify that hardcore gamers are the majority of users in the dataset, however, another study with stringent controls on user selection may have had different results.

Furthermore, I deliberately recorded INTEREST at the end of December primarily due to the activity occurring in that month and the potentially longer time available to gamers. I performed 2 separate checks on the reliability of the values I obtained and based on the results felt the data proved to be somewhat stable, but critics may still disagree with my choice of source and timing of the measurement. My approach, to limit the time over which INTEREST was measured may likewise have restricted the drivers of this INTEREST so that they are less enduring than my discussion presumes, and possibly only valid for each 24-hour period for which the data was collected.

Information on a variety of manners perhaps based on lead users' traits, characteristics, and behavior would surely add richness to my study, and I am currently lacking this information.

Likewise, additional information on contractual specifics and transactions associating the various entities involved such as publishers, developers, and other actors would help me reach more definite conclusions. Lack of information on structure prevents me from exploring how that aspect impacts performance.

Another limitation is that I have not studied exploitation in a direct manner in my thesis. Because my early work in this area indicates many approaches are available but I have as yet

found none that comfortably overcome the arguments of critics, I am continuing to look for ways to best illustrate my thinking, take a rigorous approach and continue to test H3 and H4 more formally. The lack of clarity between what products are true sequels versus other types of follow-on products makes weighting highly complex and the element of time continues to draw debates, as it often is in statistical analysis. Industry arguments on whether a game is considered a true sequel or an expansion pack can be found in abundance even with a good search engine, and came through quite clearly in the interviews I conducted, so this was an issue of some proportion that I do not feel equipped to resolve independently. For the record, I prefer an approach that leans perhaps too heavily towards simplicity, by treating all of the follow-on products as making an equal contribution to product family performance.

Additionally, I limited my study to a 6-year period during which there was greater stability in the industry and for which the data was much more reliable. However, a different period of time may have very different results, especially given the turbulent history of interactive entertainment.

Critics may likewise disagree with my choice to conduct my analysis at the level of product(game) and also that I chose not to include creators at the level of individual firm. Organizational groupings are a difficult matter in games software, due to the complexity of development projects, deals, alliances, and shifting boundaries between firms and the propensity for organizations to exist in perceptual groupings. My approach has prevented me from introducing greater analytical richness at the level of firm, especially as it pertains to costs and other measures of performance.

Finally, my interdisciplinary approach has made it difficult to present a truly cohesive approach to theory and the links may therefore be more difficult than if I had focused upon a single discipline. However, I felt compelled that to properly address the unique and complex

environment I was studying as well as its approach to knowledge access, and the lead user's role within it, I needed to draw from theories and disciplines that illuminated the issues I was examining, even if that meant taking a non-traditional approach.

9.2 Directions for Future Research and Concluding Remarks

Lead users are the focus of this work. First I build upon existing academic literature on lead users and utilize traditional empirical methods as well as the rich toolset of social network analysis to explore the implications of organizing reputational and network resources to engage lead users and potentially achieve any variety of known benefits, including lower costs, higher innovation, diffusion, and successful product development. Next, I make the case that successful innovation strategy has a good deal to do with exploring, and oftentimes integrating different trends and perspectives. In that spirit, I offer that firms should be careful not to ascribe undue importance to lead users, with case study and empirical evidence to support my claim. I conclude that the lead user is an extremely important consideration, but different customer integration appears to be required, depending on the firm's environment and innovation strategy. While the opinions of lead users appears to be important to explorative innovation, we are cautioned that organizations may be better off looking to internal resources for guidance when taking more incremental approaches that build on known needs, so the application of findings from this study should be limited accordingly. Where firms' strategic goals and vision lie, how they perceive their target market, what their costs of product development are, and what level of sales is required to recuperate costs and earn rents are all critical considerations which should determine whether firms pursue lead users, make allowances for them, or ignore them altogether.

Most industry reports on users agree on the following trends: 1) The need to control escalating costs to develop and commercialize a game; 2) The need for an alternative to

licensing; 3) Impressive user demographics, especially disposable income and education, which could potentially grow as gamers age; 4) A greater crossover in PC and video gaming than ever before; 5) The growth in the importance of casual gaming; 6) The importance of the female gamer; 7) The growing importance of online gaming and poor tracking and planning mechanisms in this area. Each of these trends signal rich streams of research in strategy that can be explored, while scholars remain confident in the noteworthy managerial implications of their work.

The environment has also become more inviting in many ways, and although I have noted generalizability as a major limitation of this thesis, interactive entertainment resembles other industries more so today than ever before. Being a hits-driven and relatively low-margin business introduced the sort of risk that has kept the heavy venture capitalists and investors out of games software, but that may be changing as a result of industry consolidation, Electronic Arts' impressive and steady stream of revenue, the entry of Microsoft into gaming, and the share of Sony's profits that come from its gaming portfolio. Besides, the pressure from Wall Street is creating more focus on deadlines, revenue streams, and other elements that are indicative of strong management teams.

The games industry is ripe for research on any number of fronts and this thesis is, in many ways, a call to explore the academic possibilities that exist.

A first opportunity for future research is to uncover whether support for H3 and H4 presented in this thesis can still be claimed after more rigorous empirical study. A more robust study of the ideas I have tried to capture with regards to exploitation appears to be of some interest, based on reactions even to my early-stage work by practitioners and academics. At this time, however, the debates on the limitations of the work and how best to construct a new dependent variable, continue.

Although an opportunity for future research is a more populous, empirical study of my core ideas, due to the derived SNA variables and the difficulty of data collection, it is not clear if extending the study beyond 20 games from each year is even feasible within a reasonable period of time, and utilizing reasonable effort. There is a larger role social network analysis can play to obtain a far richer understanding of the games industry, not just from studies on centrality, but also using such tools as equivalence studies and blockmodeling. Rich as the resultant product will probably be, I offer a single caution to scholars attempting an SNA-based analysis of the games industry: Data collection must largely be at the primary level to circumvent reliability and validity problems, and there are numerous obstacles to collecting the 100 percent required by such an analysis. To cite briefly from problems I encountered, one cannot obtain end credits from game packaging, manuals, the production company, or other reasonable methods one might employ in the case of motion pictures. Even for top-selling games, many companies do not offer support other than technical for older titles, and potentially may not even offer that minimum level of support for titles obtained through a merger or acquisition. This generally means that to extract a game's end credits, one might have to actually play the game. Furthermore, while end credits for some games are automatically available at the game's conclusion without any concern for whether the gamer won or lost, others do not present the end credits until the gamer actually wins the game; and to win could take weeks and months in the making. Upon presentation, screen capture software must be immediately available to capture the information.

There are many indications in games software that the deeply franchised, exploitation-oriented model supporting numerous sequels, licenses and franchises of one sort or another may be changing and recent positioning by EA may be a market signal that even the firm that sells 1 in 5 games in the United States and whose portfolio is about three-quarters full of repeat hits, is considering the adoption of a new strategy that is more reliant on explorative innovation. The

market is also poised for the launch of the next round of console hardware, which may be the most seamless of the cycles to-date, but posturing by the dominant players may make all the difference. Interactive Entertainment is maturing and any study of these intricacies is bound to be fascinating and rewarding.

It is clear that game developers and publishers must be careful not to overly rely on the franchise model, especially in cases in which they are not the original license holder. Success from having access to a licensed work is not guaranteed and any promise of revenue may be offset by cost. The preference for licenses and resultant aggressive bidding has driven up licensing costs, which in 2000, was about 10 percent of retail revenue. In response to THQ's guarantee to Disney Pixar of $250 million for the licensing of Finding Nemo, The Cars, and The Incredibles, game industry analyst Michael Pacter points out that only two games in history have produced $250 million in revenue, so "eventually the bidding is going to level out to probably a more realistic level, so that we're back to Spiderman, - when Sony Pictures/Marvel only got $10 million" (Hall and Ketaki, 2003). A study on the impact of licensing on performance measures such as profitability is timely.

Still, the heightened marketing and sales effort that publishers and retailers confer upon familiar titles from known franchises give sequels an advantage, and studies from the film industry corroborate the case made here for "salability" of film sequels. Given hundreds of games users choose between each year, franchises tend to be a signaling device for users and a source of at least a basic level of guaranteed sales for firms. From the perspective of the firm, game franchises provide an opportunity to test the relevance of basic product concepts versus the current interests of users; update game products to keep pace with technology; reuse vital resources such as human capital; apply organizational learning from prior ventures; and reduce risk. To the extent they continue to be successful, the rights to franchises can be an important

source of future revenue and reportedly some of the games software industry's most valuable intellectual property.

The product family model may very well be idiosyncratic to industry. Developers who are not owners or licensees of currently popular franchises are in highly disadvantageous positions as these brand franchises present barriers to entering the list of top selling titles, and therefore, also barriers to drawing rents and potentially even survival. On one hand, many in the industry appear disheartened by the success the large publishers are currently experiencing, claiming that as a result of this success there seems to be no incentive to change towards more original, innovative content. On the other hand, it seems likely that, given the history of the industry, that any original content launched would quickly morph into a product family. The business model suggests that any discontinuous change in the area of content, form, technology, or the model itself could result from the pull effects of a proactive, major publisher, or from a push by gamers themselves. Either way, many in the industry predict a shift is eminent, making these issues exciting to study and track.

The recognition of the casual gamer market is uplifting for many in the industry who are worried about the high cost of development; and the awareness of the female sector is considered an untapped and exciting opportunity for exploration. There is a movement afoot to use non-traditional distribution systems and business models to deliver simpler games supported by smaller budgets to the casual gamer, but there will be no indication of how many developers will be drawn to this sort of development and how many casual gamers will respond for some time to come. Academic models and discussions on strategy to this end are likely to be welcomed by practitioners.

Collaborative arrangements to bring a title to market are highly complex and dynamic in this industry, so the measurement of performance at the traditional level of firm does not always

represent an accurate depiction of results. I have introduced a non-traditional measure of performance in this study: One that is user-based and considers lead user interest in a product at a point past what is normally considered the product's life expectancy. This type of measurement can give stakeholders a perspective of the revenue growth and opportunities generated at a product level, assessed separately from the constraints and complexity arising from questions relating to the product's ownership and distribution of rents. Future academic studies might address other non-traditional measures of performance that can be applied to unique and hybrid organizational forms.

Here, lead user interest was used to ascertain what products are of greater perceptual importance to lead users in a community. Measures that that rely upon the perspective of the user as a proxy for performance are in short supply and appear to be viewed with some skepticism, however, the notion of *salience* is already a rich area for exploration in other fields of strategy, most notably, political science and communication. Since we have already accepted that lead users innovate ahead of market trends, their product-related interests may indicate future innovation opportunities for the mass market and elements worthy of reuse in the creation of a formula for success or in understanding future trends. In this sense, *Salience* may be studied for prediction. To complement traditional performance measures, such as sales, we need non-traditional measures of market interest that enable management to evaluate potential opportunities and threats, or put differently, the enablers of and detractors from future rents, especially when more traditional measure prove elusive.

Whether lead user interest is unduly dynamic in the games industry and whether its drivers are enduring, remains to be seen. What we know is that hardcore gamers are not average consumers, and they do not see themselves as part of a mass market: They are highly knowledgeable, highly involved lead users whose sense of identity is intermingled with their

game-specific affiliations, that include not just the products, but the producers of those products as well. What is of perceptual importance to them ultimately determines what they will purchase, play, master, discuss, change, and support.

From my early work, I have indication that investigating environments subjected to mergers may actually benefit from better performance in the area of exploitation. I do not propose that the importance of team structure and other elements of stability including leadership, that have already been shown to be of importance in project management are in any way diminished, but that this may be a provocative area for future inquiry. Mergers and acquisitions in the interactive entertainment software environment have been a way of life over the period under investigation. As the costs and risks of development rose in the industry and marketing and distribution became critical, few small development houses were able to launch financially successful products without a strong partner, who was often accessible only through a change in ownership. Studying the impact of changes in ownership within games software could potentially uncover exciting results.

The price sensitivity that practitioners associate with the proliferation of the sequel also warrants further investigation and a study of exploitation in this industry should attempt to include price as a determinant. In spite of the commercial success of these games, consumer research conducted by the ESA in 2004 revealed that 70 percent of all male gamers want the game industry to rely less on licensed content and more on original content. Whether gamers are prepared to pay higher prices for games with original content or whether this price sensitivity is an overall trend affecting game software today and a question of significant interest to practitioners.

Finally, we have acknowledged that the basis of long-term competitive advantage lies in firms' abilities to simultaneously create value from exploiting (March, 1991) or applying

(Spender, 1992) existing knowledge, and generating new knowledge (Spender, 1992). Tushman and O'Reilly (1996, 2004) have referred to this balancing act as *ambidexterity*, and likened business executives' conundrum to that of Janus[53]: "They, too, must constantly look backward, attending to the products and processes of the past, while also gazing forward, preparing for the innovations that will define the future". Emerging theories on knowledge and the role of the user in the innovation process have destabilized our beliefs about producer and user knowledge in two important ways: First, our deeper understanding of the difficulty of knowledge transfer and recognition of new organizational forms, wherein interfirm collaboration and fluid boundaries predominate, has paved the way for theory on *knowledge access* (Grant and Baden-Fuller, 2004; Collins, 2004), that is differentiated in important ways from knowledge acquisition or transfer. Second, we have embraced the tracking of an important group of users known as *lead users*, to guide organizations to successful trends ahead of the market.

Using an exciting, complex, and topical context such as the U.S. Interactive Entertainment; March's seminal ideas (1991) on *exploitation-exploration* as well as emerging work on *knowledge access* as theoretical grounding; and overlaying the call of Tushman and O'Reilly for *ambidexterity* (Tushman & O'Reilly, 1996; O'Reilly and Tushman, 2004), there are as yet many research questions to be asked and answered, especially by senior researchers who are skilled in the art of theory, under the canopy of: *What are the knowledge access requirements for successful ambidextrous performance in environments dominated by lead users?* It is here, I firmly believe, that some of the most engaging future contributions to the field of strategic management may be made.

---

[53] The two-headed Roman deity of passages or beginnings, capable of viewing both the past and the future, who respresents one of the oldest dichotomies. The term *Janus-faced* means to hold contrasting views.

REFERENCES

Aaker, David A. 1996. *Building Strong Brands.* The Free Press: New York

Abernathy, W.J. & Utterback, J.M. 1978. Patterns of Industrial Innovation. *Technology Review*, 80: 97-107.

Adams, E. 2000. The designer's notebook: Casual versus core. *Gamasutra* (August 1).

Adams, E. 2005. Designer's notebook: A few remarks on creative play. *Gamasutra* (April 29).

Ahuja, M. K., Galletta, D. F., & Carley. K. M. 2003. Individual centrality and performance in virtual R&D groups: An empirical study. *Management Science*, 49: 21-38.

Alba, J.W., Hutchinson, J.W., & Lynch, J. 1991. Memory and decision making. In T.S. Robertson & H.H. Kassarjian (eds.), *Handbook of consumer behavior*: 1-49. New Jersey: Prentice Hall.

Anderson, N. A. 1961. Scales and statistics: Parametric and non-parametric. *Psychological Bulletin*, (July) 58:305-316.

Argote, L., Beckman, S.L., & Epple, D. 1990. The persistence and transfer of learning in industrial settings. *Management Science*, 36:140-154.

Argote, L. & Ingram, P. 2000. Knowledge transfer: A basis for competitive advantage in firms. *Organizational Behavior and Human Decision Processes,* 82:150-169.

Austin, A. 2004. Indie postmortem: Chronic Logic's Gish. *Gamasutra*, Dec 13.

Austin, B. A. 1989. *Immediate seating – A look at movie audiences*. Belmont: Wadsworth.

Austin, B.A. & Gordon. T.F. 1987. Movie genres: Toward a conceptualized model and standardized definitions. *Current Research in Film: Audiences, Economics and the Law*, 4: 12-33.

Baden-Fuller, C., & Winter, S.G. 2005. *Replicating knowledge practices: Principles or templates?* Working Paper, Sir John Cass Business School, May 16, 2005.

Bahrami, H. & Evans, S. 2005. *Super-flexibility for knowledge enterprises*. Berlin: Springer.

Bahrami, H. & Evans, S. 1989. Strategy making in high-technology firms: The empiricist mode. *California Management Review*, 31(2), 107-129.

Baldwin, T.T., Bedell, M.D., & Johnson, J.L. 1997. The social fabric of a team-based M.B.A. program: Network effects on student satisfaction and performance, *Academy of Management Journal*, 40: 1369-1397.

Barabasi, A.L. & Bonabeau, E. 2003. Scale free networks. *Scientific American, May:* 60-69.

Barney, J. 1991. Firm resources and sustained competitive advantage. *Journal of Management*, 17: 99-120.

Bartlett, C.A, & Ghoshal, S. 1988. Organizing for worldwide effectiveness: The transnational solution, *California Management Review*, 31: 54-75.

Bass, F. M. 1969. A new product growth model for consumer durables. *Management Science*, 15: 215-228.

Baum, G., Ittner, C., Larcker, D., Low, J., Siesfeld, T. & Malone, M.S. 2000. Introducing the new value creation index. *Forbes* ASAP April 3: 140–143.

Bavelas. 1948. A mathematical model of group structure. *Human Organizations*, 7: 16-30.

Bearden, J., Atwood. W., Freitag, P., Hendricks, C., Mintz, B., & Schwartz, M. 1975. *The nature and extent of bank centrality in corporate networks*. Presented at the annual meeting of the American Sociological Association, San Francisco, CA.

Becker, B. W., Brewer, B., Dickerson, B., & Magee, R. 1985. The influence of personal values on movie preferences. B. A. Austin (Editor), *Current Research in Film: Audiences, Economics, and Law* (Volume 1) (pp. 37-50). Norwood, NJ: Ablex.

Bettman, J. R., Johnson, E.J., & Payne, J.W. 1991, Consumer decision making. In T. S. Robertson & H.H. Kassarjian (eds.), *Handbook of consumer behavior*: 50-84. New Jersey: Prentice Hall.

Boer, J. 1999. Deer Hunter's three-month development cycle. *Gamasutra* (January 8).

Bolland, J.M. 1988. Sorting out centrality: An analysis of the performance of four centrality models in real and simulated networks. *Social Networks*, 10:233-53.

Bonacich, P. 1987. Power and centrality: A family of measures. *American Journal of Sociology*, 92:1170-82.

Bonardi, J. & Durand, R. 2003. Managing network effects in high tech markets. *Academy of Management Executive*, 17: 40-52.

Borgatti, S.P., Everett, M.G., & Freeman, L.C. 2002. *Ucinet 6 for Windows*. Harvard: Analytic Technologies, Inc.

Bradach, J. L. 1998. *Franchise organizations*. Boston: Harvard Business School Press.

Bradach, J. L. 1997. Using the plural form in the management of restaurant chains. *Administrative Science Quarterly*, 42: 276-303.

Brandenberger, A.M. 2002. http://www38.homepage.villanova.edu/william.oneill/EMBA_Strategic_Marketing/ Marketing_Management_Fall2002/Classic_Articles/TheRightGameBrandenburger.htm

Brandenburger, A.M., & Nalebuff, B.J. 1996. *The right game: Use game theory to shape strategy*, Currency/Doubleday.

Brass, D.J. 1984. Being in the right place: A structural analysis of individual influence in an organization, *Administrative Science Quarterly*, 29: 14-31.

Brockhoff, K. 2003. Customers' perspectives of involvement in new product development, *International Journal of Technology Management*, 26(5/6): 464-481.

Brusoni, S., Prencipe, A. & Pavitt, K. 2001. Knowledge specialization, organizational coupling, and the boundaries of the firm: Why do firms know more than they make? *Administrative Science Quarterly*, 46: 597-622

Caves, R., & Murphy, W.F. 1976. Franchising: Firms, markets and intangible assets. *Southern Economic Journal*, 42: 572-86.

Chesbrough, H.W., 2003a. *Open innovation: The new imperative for creating and profiting from technology*. Boston, MA: Harvard Business School Press.

Chesbrough, H.W., 2003b. The era of open innovation, *MIT Sloan Management Review*, 44: 35-41.

Christensen, C. M. 1997. *The innovator's dilemma*. Boston: Harvard Business School Press.

Cohen, W.M., & D.A. Levinthal. 1990. Absorptive capacity: A new perspective in learning and innovation. *Administrative Science Quarterly*, 17:178-184.

Collins, H., 2004. Interactional expertise as a third kind of knowledge. *Phenomenology and the Cognitive Sciences*, 3:125-143.

Cook & Whitmeyer. 1992. Two approaches to social structure: Exchange theory and network analysis. *Annual Review of Sociology*, 18: 109-27.

Cooper, D. R., & Emory, W. 1995. *Business research methods, 5th edition*, Chicago: Irwin.

Coughlan, P. J. 2001a. *Note on home video game technology and industry structure*, Harvard Business School Case # 9-700-107, June 13, 2001.

Coughlan, P. J. 2001b. *Competitive dynamics in home video games(I): The Sony Playstation*, Harvard Business School Case # 9-701-099, June 12, 2001

Coughlan, P. J. 2001c. *Competitive dynamics in home video games(B): Nintendo Power*, Harvard Business School Case # 9-701-092, June 13, 2001

Cravens, K., Oliver, E.G., & Ramamoorti, S. 2003. The reputation index: Measuring and managing corporate reputation. *European Management Journal*, 21(2): 201-212.

Cross, R. & Cummings, J.N. 2004. Tie and network correlates of individual performance. *Academy of Management Journal*. 47: 928-938.

D'Aveni, R. 1994. *Hypercompetitive rivalries: Competing in highly dynamic environments*. New York: Free Press.

Davenport, T.H. & Beck, J.C. 2001. *The Attention Economy*. Boston: Harvard Business School Press.

DFC Intelligence. 2004. *The business of computer and video games 2004*. San Diego, CA.

Diamante, V. 2005. E3 report: New practices in licensing and ancillary rights. *Gamasutra* (May 23).

DiMaggio, P.J. O & Powell,W.W. 1983. The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, 48: 147-161.

Douglas, S. P., & Wind, Y. 1987. The myth of globalization. *Columbia Journal of World Business*, 22(4): 19-30.

Edwards, C. 2005. Making a play for all those non-players. *Business Week*, Oct 3:39.

Edwards, G.C., & Mitchell, W. 1995. Explaining presidential approval: The significance of issue salience. *American Journal of Political Science*, 39: 108-135.

Eisenhardt, K.M. 1989. Making fast strategic decisions in high-velocity environments. *Academy of Management Journal*, 32:543-577.

Eisenhardt, K. M., & Martin, J.A. 2000. Dynamic capabilities: What are they? *Strategic Management Journal*, 21: 1105-1121.

Evans, S., & Bahrami, H. 1995. Flexible re-cycling and high-technology entrepreneurship. *California Management Review*, 37(3): 62-90.

Fleishman, J.A. 1986. Trends in self-identified ideology from 1972 to 1982: No support for the salience hypothesis. *American Journal of Political Science*, 30: 517-541.

Florida, R.L., & Kenney, M. 1990. *The breakthrough illusion: Corporate America's failure to move from innovation to mass production*. New York: BasicBooks.

Folkes, V.S. & Keisler, T. 1991. Social cognition: consumers' inferences about the self and others, In *Handbook of consumer behavior*, eds. Robertson, Thomas S. and Harold H. Kassarjian, pp 281-315, New Jersey: Prentice Hall.

Fombrun, C.J. 1995. *Reputation: Realizing value from the corporate image*, Harvard Business School Press, Boston.

Fombrun, C. & Shanley, M. 1990. What's in a name? Reputation building and corporate strategy. *Academy of Management Journal*, 33: 233-259.

Franke, N. & Shah, S. 2003. How communities support innovative activities: An exploration of assistance and sharing among end-users. *Research Policy* 32: 157-178.

Franke N., & von Hippel, E. 2003. Satisfying heterogeneous user needs via innovation toolkits: The case of Apache security software. *Research Policy*, 32: 1199-1215.

Frederickson, A., Strong, M, & Humphrey, H., 2001. *Utah Technology Report: Video Games*, August, State Department of Utah.

Freeman, L.C. 1979. Centrality in social networks: I. Conceptual clarification. *Social Networks*, 1:215-239.

Gallagher, S. & Park, S.H., 2002. Innovation and competition in standards-based industries: A historical analysis of the U.S. home video game market, *IEEE Transactions on Engineering Management*, 49: 67-82

Gartenberg, M. 2003. *Understanding the PC and Console game market audience: Shifts in composition create new opportunities*. Jupiter Research.

Gatignon, H. & Robertson, T.S. 1991. Innovative decision processes. In T.S. Robertson & H.H. Kassarjian (eds.), *Handbook of consumer behavior*: 316-348. New Jersey: Prentice Hall.

Gavetti, G., Levinthal, D.A., & Rivkin, J.W. 2005. Strategy making in novel and complex worlds: The power of analogy. *Strategic Management Journal*, 26:691-712.

Gawer, A. & Cusumano, M.A. 2002. *Platform leadership*. Boston, MA: Harvard Business School Press.

Gay, B., & Dousset, B. 2005. Innovation and network structural dynamics: Study of the alliance network of a major sector of the biotechnology industry. *Research Policy*, 34:1457-1475.

Gerard Klauer Mattison. 2003. In IDG Entertainment, *2003 Industry white paper: High Stakes in Interactive Entertainment*, 11:June.

Goldfield, Robert, Hollywood Finishes 2001 on Up Note
http://portland.bizjournals.com/portland/stories/2002/02/25/story1.html?page=2

Gomory, R. E., 1989, From the `ladder of science' to the product development cycle. *Harvard Business Review*, 67(6): 99-105

Grant, R. M. 2005. *Contemporary strategy analysis, 5th edition*. Malden, MA: Blackwell Publishing.

Grant, R. M. 1996. Towards a knowledge-based theory of the firm. *Strategic Management Journal*, 17 (Winter): 109-122.

Grant, R. M. & Baden-Fuller, C. 2004. A knowledge accessing theory of strategic alliances", *Journal of Management Studies*, 41: 61-85.

Griffin, A. & Page, A. 1993. An interim report on measuring product development success and failure. *Journal of Product Innovation Management*, 10: 291-308.

Grossman, A. (ed.). 2003. *Postmortems from Game Developer*. San Francisco: CMP Books.

Hair, J., Anderson, R.E., Tatham, R.L., & Black, W.C. 1998. *Multivariate data analysis, Fifth ed*. New Jersey: Prentice Hall.

Hall, W. & Ketaki, S. 2003. The big merger. **www.larta.org**, April 28.

Halman, J. I.M., Hofer, A.P., & van Vuuren, W. 2003. Platform-driven development of product families: Linking theory with practice", *Journal of Product Innovation Management*, 20:149-162.

Hannan, M. T., Pólos, L. & Carroll, G. 2003. Cascading organizational change. *Organization Science*, 14: 463-482.

Hayton, J.C. 2005. Competing in the new economy: The effect of intellectual capital on corporate entrepreneurship in high-technology new ventures. *R & D Management*, 35(2):137-155

Henkel, J. & Thies, S. 2003. Customization and innovation: User innovation toolkits for simulator software. In *Proceedings of the 2003 Congress on Mass Customization and Personalization*. October. Munich: MCPC.

Hennig-Thurau, T., Houston, M.B., & Walsh, G.J. 2003. Unveiling the mysteries of motion picture success: An interrelationship approach of the determinants of motion picture box office. In *Enhancing Knowledge Development in Marketing: Proceedings of the 2003 AMA Summer Educators' Conference*, 14: 270-271. Chicago: American Marketing Association.

Hennig-Thurau, T., Walsh, G.J., & Wruck, O. 2001. An investigation into the factors determining the success of service innovations: The case of motion pictures, *Academy of Marketing Science Review*, 2001:6.

Herstatt, C., & von Hippel, E. 1992. From experience: Developing new product concepts via the lead user method. *Journal of Product Innovation Management* 9: 213–222.

Hogg, M.A., Terry,D.J., & White, K.M. 1995. A tale of two theories: A critical comparison of identity theory with social identity theory. *Social Psychology Quarterly*, 58(4): 255-269.

Howell, J. M. 2005. The right stuff: Identifying and developing effective champions of innovation. *Academy of Management Executive*, 19(2): 108-119.

Huebner, D., & Olsen, J. 1999. Pokémon rules, *Gamasutra Newswire*, Nov 12.

Hui, K.L. 2004. Product variety under brand influence: An empirical investigation of personal computer demand. *Management Science*, 50(5): 686-700.

Humphreys, M., & Garry J. 2000. *Thinking about salience*. Dublin.

IDG Entertainment, *2003 Industry white paper: High stakes in interactive entertainment*, 11:June.

Ip, B. & Adams, E. 2002. From casual to core: A statistical mechanism for studying gamer dedication. *Gamasutra*. San Francisco: CMP Media.

Ipsos Insight for the ESA. 2005. 2005 Sales, demographics and usage data: Essential facts about the computer and video game industry. San Francisco: The ESA.

Jensen, R. 1992. Reputational spillovers, innovation, licensing, and entry. *International Journal of Industrial Organization*, 10:193-213.

Jeppesen, L. B. 2005. User toolkits for innovation: Users support each other. *Journal of Product Innovation Management*, 22: 347-362.

Jeppesen, L.B., 2002. *The implications of "user toolkits for innovation"*. Working paper, Centre for Economic and Business Research, The Danish Ministry of Economic and Business Affairs.

Jeppesen, L. B., & Frederiksen, L. 2005. *Why do users contribute to firm-hosted user communities?* Working paper, Copenhagen Business School.

Jeppesen, L. B., & Molin, M.J. 2003. Consumers as co-developers: Learning and innovation outside the firm. *Technology Analysis and Strategic Management*, 15: 363–84.

Johnson, D.R., & Creech, J.C. 1983. Ordinal measures in multiple indicator models: A simulation study of categorization error. *American Sociological Review*, 48: 398-407.

Johnson, E. J., & Russo, J.E. 1984. Product familiarity and learning new information. *Journal of Consumer Research*, 11: 542-550.

Karamanos, A.G. 2003. Complexity, identity and the value of knowledge-intensive exchanges. *Journal of Management Studies*, 40: 1871-1890.

Kashani, K. 1989. Beware the pitfalls of global marketing. *Harvard Business Review*, 67(Sept-Oct): 91-98.

Kassis, D. 2006. It's a mod, mod world *http://ccnmag.com/story.php?id=15*

Kelly, T. 2004. Soapbox: Technoholism – A 12-step recovery plan. *Gamasutra* (Dec 29).

Kim, S. 2001. Designing web games that make business sense. *Game Developer's Conference 2001 Proceedings*, 423-31, San Francisco, CA.

Kogut, B. & Zander, U. 1992. Knowledge of the firm, combination capabilities, and the replication of technology. *Organization Science*, 3: 383-397.

Kotler, P. 1986. The prosumer movement: A new challenge for marketers. *Advances in Consumer Research*, 13(1): 510-514.

Krackhardt, D. 1992. The strength of strong ties: The importance of philos in organizations, In (eds.) Nohria and Eccles, *Networks and Organizations: Theory and Practice*, chapter 3. Boston: Harvard Business School Press.

Kretschmer, M., Klimis, G.M., & Choi, C.J. 1999. Increasing returns and social contagion in cultural industries. *British Journal of Management*, 10: S61-S72.

Krishnan, V., & Ulrich. 2001. Product Development Decisions: A Review of the Literature, *Management Science*, 47: 1-21.

Labovitz, S. 1970. The Assignment of numbers to rank order categories. *American Sociological Review*, 35: 151-524.

Labovitz, S. 1967. Some observations on measurement and statistics. *Social Forces*, 46(December): 151-160.

Lakhani, K.R., & von hippel, E. 2000, *Emerging economics of virtual communities: "Free" user-to-user assistance in open source software*, MIT Sloan School of Management, Working Paper No. 4117.

Lakhani, K. & Wolf, B. 2005. Why hackers do what they do: Understanding motivation and effort in free/open source software projects. In J. Feller, B. Fitzgerald, S. Hissam, & K. R. Lakhani. *Perspectives on free and open source software*. Cambridge, MA: MIT Press.

Lampel, J., Lant, T., & Shamsie, J. 2000, Balancing act: Learning from organizing practices in cultural industries, *Organization Science*, 11(3): 263-269.

Lampel, J., & Shamsie, J. 2000. Critical push: Strategies for creating momentum in the motion picture industry. *Journal of Management*, 26(2): 233-257.

Lechner, C., & Dowling, M. 2003. Firm networks: External relationships as sources for the growth and competitiveness of entrepreneurial firms. *Entrepreneurship & Regional Development*, 15(1): 1-27.

Lemak, D.J., & Arunthanes, W. 1997. Global business strategy: A contingency approach. *Multinational Business Review*, 5(1): 26-38.

Lewis, J. 2003. The Sims Online evolution: A case study. *Gamasutra*, September 17.

Lewis, P. 2003. Videogames: The biggest game in town. *Fortune*, September 2.

Lilien, G.L., Morrison, P.D., Searls, K., Sonnack, M., & von Hippel, E. 2002. Performance assessment of the lead user idea-generation process for new product development, *Management Science*, 48:1042-1059.

Litman, B. R. 1983. Predicting success of theatrical movies: An empirical study. *Journal of Popular Culture*, 16: 159-175.

Lowenstein, D. 2001 Remarks of Douglas Lowenstein, President, Interactive Digital Software Association, *Electronic Entertainment Exposition (E3)*, May 17..

Lüthje, C. 2004. Characteristics of innovating users in a consumer goods field: An empirical study of sports-related product consumers. *Technovation*, 24: 683-695.

Lüthje, C. 2003. Customers as co-inventors: An empirical analysis of the antecedents of customer-driven innovations in the field of medical equipment. In **Proceedings of the 32nd EMAC Conference**, Glasgow.

Lüthje, C., & Herstatt, C. 2004. The lead user method: An outline of empirical findings and issues for future research. *R & D Management*, 34: 553-568.

Lüthje, C., Herstatt, C., & von Hippel, E. 2005. User innovators and "local" information: The case of mountain biking. *Research Policy*, 34: 951-965.

Lüthje, C., Herstatt, C., & von Hippel, E. 2002. *The dominant role of local information in user innovation: The case of mountain biking*, Working Paper 4377-02, MIT, Sloan School of Management.

Lynn, G. S., Morone, J.G., & Paulson, A.S. 1996. Marketing and discontinuous innovation: The probe and learn process. *California Management Review*, 38(3): 8-37.

Magnusson, P. R. 2003. *Customer-oriented product development: Experiments involving users in service innovation*. Ph.D. thesis. Stockholm School of Economics, Stockholm.

March, J. G. 1991. Exploration and exploitation in organizational learning. *Organization Science*, 2: 71-88.

Markides, C.C., & Williamson, P.J. 1994. Related diversification, core competences and corporate performance. *Strategic Management Journal*, 15 (Special Issue): 149-166.

Marsden, P. 1990. Network data and measurement. *Annual Review of Sociology*, 16:435-63.

McCall, G.J., & Simmons, J.T. 1978. *Identities and interaction*, New York: Free Press.

McPherson, M. & Smith-Lovin, L. 1987. Homophily in voluntary organizations: Status distance and the composition of face-to-face groups. *American Sociological Review*, 52:370-379.

McPherson, M., Smith-Lovin, L., & Cook, J.M. 2001. Bird of a feather: Homophily in social networks. *Annual Review of Sociology*, 27: 415-444.

Mehra, A., Kilduff, M., & Brass, D.J. 2001. The social networks of high and low self-monitors: implications for workplace performance. *Administrative Science Quarterly*, 46: 121-146.

Meyer, M.H., & Lopez, L. 1995. Technology strategy in a software products company. *Journal of Product Innovation Management* 12:294-306.

Meyer, M. H., Tertzakian, P. & Utterback, J.M. 1997. Metrics for managing research and development in the context of the product family. *Management Science* 43: 88-112.

Meyer, M. H., & Utterback, J.M. 1993. The product family and the dynamics of core capability. *Sloan Management Review*, 34(3): 29-48.

Meyer, M.H., & Utterback, J.M. 1992. *The product family and the dynamics of core capability*, WP#77-92, The International Center for Research on the Management of Technology, Sloan WP#3490-92.

Miniard, P.W., Unnava, H.R., & Bhatla, S. 1989. Inhibiting brand name recall: A test of the salience hypothesis. *Advances in Consumer Research*, 16, 264-270.

Mizruchi, M.S. 1994. Social network analysis: Recent achievements and current controversies. *Acta Sociologica* (Taylor & Francis Ltd), 37: 329-344.

Morrison, P. D., Roberts, J. H., & Midgley, D. F. 2004. The nature of lead users and measurement of leading edge status. *Research Policy*, 33: 351–362.

Neelamegham, R. & Chintagunta, P. 1999. A Bayesian model to forecast new product performance in domestic and international markets, *Marketing Science*, 18: 115-136.

Nelson, R. A., Donihue, M.R., Waldman, D.M., & Wheaton, C. 2001. What's an Oscar worth? *Economic Inquiry*, 39: 1-16.

Nelson, R.R., & Winter, S.G. 1982. *An evolutionary theory of economic change*. Cambridge, MA: Belnap Press.

Nerkar, A., & Roberts, P.W. 2004. Technological and product-market experience and the success of new product introductions in the pharmaceutical industry. **Strategic Management Journal**, 25:779-799.

Nonaka , I., & Takeuchi, H. 1995. *The knowledge creating company*. New York: Oxford University Press.

Nizumi, H. Iwata: Revolution will bring a paradigm shift to gaming. *Gamespot* http://hardware.gamespot.com/Story-ST-15143-1434-4-6-x

Oliver, C. 1990. Determinants of interorganizational relationships: Integration and future directions. *Academy of Management Review*, 15:241-265.

O'Reilly, C. III & Tushman, , M. L 2004 The ambidextrous organization. **Harvard Business Review**, 82(4): 74-81.

Pappas, J. M. 2004. Middle managers' strategic influence: Investigating network centrality and perceptual deviance. *Academy of Management Proceedings*, C1-C6.

Pham, A,, 2003. Game Creators Play it Safe in '03; Industry Turns to Sequels, Tie-Ins. *Chicago Tribune*, May 17, pg 3

Piller, F., Schubert, P., Koch, M., & Möslein, K. 2005. Overcoming mass confusion: Collaborative customer co-design in online communities. *Journal of Computer-Mediated Communication*, 10(4), article 8. http://jcmc.indiana.edu/vol10/issue4/piller.html

Powell, J. 2002. GDC 2001: Negotiating contracts that protect your title and team. *Gamasutra*, January 23.

Powell, W.W., Koput, K.W., & Smith-Doerr, L. 1996. Interorganizational collaboration and the locus of innovation: Networks of learning in biotechnology. *Administrative Science Quarterly*, 41: 116-145.

Prosumer References: Cook, W.A., 1997. Editorial: World wide wake-up call, *Journal of Advertising Research*, 37(2): 5; Grotta, D., & Wiener, S. 1999. Shoot like the pros, *PC Magazine*, 18(3): 48-50; *Economist*. 2004. Digital cameras zoom in. 370(8366): 21; Manes, S. 2004. Def high. *Forbes*, 174(12): 72-77; Nathans, S.F. 2005. CES 2005. *EventDV*, 18(2): 10-14; *Business CustomWire*. 2005. KPN and Research In Motion introduce BlackBerry internet service in Belgium and the Netherlands. March 30.; Kenny, T. 2005. We all care about quality. *Mix*, 29(6): 10.

Rao, H., Davis, G.F. & Ward, A. 2000, Embeddedness, social identity and mobility: Why firms leave the NASDAQ and join the New York Stock Exchange. *Administrative Science Quarterly*, 45: 268-293.

Ravid, S. A. 1999. Information, blockbusters, and stars: A study of the film industry. *Journal of Business* , 72: 463-492.

Reinertsen, D.G. & Smith, P.G. 1991. The strategist's role in shortening product development. *Journal of Business Strategy*, 12(4): 18-22.

Rivkin, J.W. 2000. Imitation of complex strategies. *Management Science*, 46: 824-844.

Roberts, E.B. 1988. What we've learned - managing invention and innovation. *Research Technology Management*, January-February: 11-29.

Rogers, D. L. 2005. The end game: 2005 acquisition activity update, *Gamasutra*, Feb 25.

Rogers, D. L. 2004a. The end game: How top developers sold their studios - Part one, *Gamasutra*, March 3.

Rogers, D. L. 2004b. The end game: How top developers sold their studios - Part two", *Gamasutra*, March 5.

Rogers, Everett M. 1962, 1983, 1995, *Diffusion of innovations*, first, third and fourth editions. New York: The Free Press.

Rosenberg, M. 1979. *Conceiving the self,* New York: Basic Books.

Rosenbloom, R.S., & Cusumano, M.A. 1987. Technological pioneering and competitive advantage: The birth of the VCR industry. *California Management Review*, 29: 51-76.

Roure, J.B., & R.H. Keeley. 1990. Predictors of success in new technology based ventures. *Journal of Business Venturing*, 5: 221-239.

Rumelt, R. P., Schendel D.E. & Teece, D.J. 1994. *Fundamental issues in strategy: A research agenda*. Boston: Harvard Business School Press.

Sanchez, R., & Mahoney, J.T. 1996. Modularity, flexibility, and knowledge management in product and organization design. *Strategic Management Journal*, 17 (Winter), 63-76.

Sanderson, S., & Uzumeri, M. 1995. Managing product families: The case of the Sony Walkman", *Research Policy*, 24: 761-782.

Sawhney, M. S., & Eliashberg, J. 1996. A parsimonious model for forecasting gross box-office revenues of motion pictures. *Marketing Science*, 15(2):113-132.

Schilling, M. A. 2003. Technological leapfrogging: Lessons from the U.S. video game console industry. *California Management Review*, 45:6-32, Spring.

Schumpeter, J.A. 1934. *The theory of economic development*. Cambridge, MA: Harvard University Press.

Scott, J. 1991. *Social network analysis: A handbook*. London: Sage.

Shah, S. 2005 (forthcoming). Open beyond software, In D. Cooper, C. DiBona & M. Stone, *Open sources 2*. Sebastopol, CA: O'Reilly Media.

Shah, S. 2000. *Sources and patterns of innovation in a consumer products field: Innovations in sporting equipment*. Working paper 4105, MIT, Sloan School of Management.

Shankar, V. & Bayus, B.L. 2003. Network effects and competition: an empirical analysis of the home video game industry. *Strategic Management Journal*, 24: 375-384.

Shelley, B. 2001. Guidelines for developing successful games, *Game Developer Magazine* August 15.

Shepard, H. A. 1967. Innovation-resisting and innovation-producing organizations. *The Journal of Business*, 40: 470-477.

Sicca, L. M. 2000. Chamber music and organisation theory: Some typical organisational phenomena seen under the microscope. *Studies in Cultures, Organisations and Societies*, 6: 145-168.

Simon, H.A. 1955. A behavioral model of rational choice. *Quarterly Journal of Economics*, 69: 99-118.

Simonet, T. 1987. Conglomerates and content remakes, sequels and series in the new Hollywood. *Current Research in Film: Audiences, Economics, and Law*, 3: 154-162.

Sirgy, M.J. 1982. Self-concept in consumer behavior, a critical review. *Journal of Consumer Research*, 9: 287-300.

Smallwood, K. 2002. Blockbuster set to make game transition. *Next Level Gaming*, May 13, http://www.nlgaming.com/news/2329/index.html

Sparrowe, R.T., Liden, R.C., Wayne, S.J., & Kraimer, M.L. 2001. Social networks and the performance of individuals and groups. *Academy of Management Journal*. 44:316:325.

Spender, J.C. 1992. Limits to learning from the west. *The International Executive*, 34:389–410.

Stepanek, S. 2004. *Influence of online word of mouth on domestic box office performance prior to film release*. (Feb) Working paper.

Stryker, S. 1980. *Symbolic Interactionism: A Social Structural Version*. Menlo Park: Benjamin/Cummings.

Stryker, S. & Serpe, R.T. 1994, Identity Salience and Psychological Centrality: Equivalent, Overlapping, or Complementary Concepts? *Social Psychology Quarterly*, 57: 16-35

Szulanski, G. 2000. Appropriability and the challenge of scope: Banc One routinizes replication. *Nature & Dynamics of Organizational Capabilities*, 69-99.

Szulanksi, G. 1996. Exploring internal stickiness: Impediments to the transfer of best practice within the firm, *Strategic Management Journal*, 17:27-44.

Szulanski, G., & Winter, S. 2002. Getting It Right the Second Time. *Harvard Business Review*, 80(1): 62-69.

Teece, D. J. 1999. *Strategies for managing knowledge assets: The role of firm structure and industrial context, 3rd draft*, August 1, Haas School of Business.

Teece, D. J. 1998. Capturing value from knowledge assets: The new economy, markets for know-how, and intangible assets. *California Management Review*, 40(3): 55-79.

Teece, D. J. 1992. Competition, co-operation, and innovation. *Journal of Economic Behavior and Organisation*, 18, 1–25.

Teece, D. J. 1986. Profiting from technological Innovation. *Research Policy*, 15:285-305.

Teece, D.J., Pisano, G. & Shuen, A. 1997. Dynamic capabilities and strategic management, *Strategic Management Journal*, 18: 509-533.

Tidd, J., Bessant, J., & Pavitt, K. 2001. *Managing innovation: Integrating technological, market, and organizational change*, 2nd Ed., West Sussex: John Wiley & Sons.

Toffler, A. 1980. *The Third Wave*, New York: Morrow

Tsai, W., 2001, "Knowledge transfer in intraorganizational networks: Effect of network position and absorptive capacity on business unit innovation and performance. *Academy of Management Journal*, 44(5): 996-1004.

Tushman, M. L., & Anderson, P. 1997. *Managing strategic innovation and change: A collection of readings*. New York: Oxford University Press.

Tushman, M.L., & O'Reilly, C. III, 1996, Ambidextrous organizations: Managing evolutionary and revolutionary change. *California Management Review*, 38(4): 8-31.

Utterback, J. M. 1994. *Mastering the dynamics of innovation*, Harvard Business School Press: Boston, MA.

Venkatraman, N. & Lee, C. 2004, Preferential linkage and network evolution: A conceptual model and empirical test in the U.S. Video Game Sector. *Academy of Management Journal*, 47: 876-893.

Verspagen, B., & Werker, C. 2004. Keith Pavitt and the invisible college of the economics of technology and innovation. *Research Policy*, 33:1419-1431

Veryzer, R. W. 1998. Discontinuous innovation and the new product development process. *Journal of Product Innovation Management*, 15: 304–321.

von Hippel, E. 2005. *Democratizing innovation*. Cambridge, MA: The MIT Press.

von Hippel, E. 2001. Perspective: User toolkits for innovation. *Journal of Product Innovation Management*, 18: 247–257.

von Hippel, E. 1998. Economics of Product Development by Users: The Impact of Sticky Local Information. *Management Science*, 44: 629–644.

von Hippel, E. 1994. Sticky information and the locus of problem solving: Implications for innovation. *Management Science*, 40: 429–439.

von hippel, E. 1988. *The sources of innovation*. New York: Oxford University Press.

von Hippel, E. 1986. Lead users: A source of novel product concepts. *Management Science*, 32: 791–805.

von Hippel, E. 1977. Transferring process equipment innovations from user- innovators to equipment manufacturing firms. *R&D Management*, 8(1):13–22.

von Hippel, E. 1976. The dominant role of users in the scientific instrument innovation process. *Research Policy*, 5: 212–39.

von Hippel, E. & Sonnack, M. 1999. *Breakthroughs to Order at 3M*, MIT-SSM Working Paper, January.

Ward, 1996 The Start of a Revolution. *www.gamespot.com* and *http://www.getgamer.com/Reviews/ItemId/B00004SW2G*

Wardell, B. 2003. Postmortem: Stardock's Galactic Civilizations. *Gamasutra*, May 7.

Wasserman, S., & Faust, K. 1994, *Social network analysis*, 169-219. Cambridge: Cambridge University Press.

West, M. A., & Anderson, N. R. 1996. Innovation in top management teams. *Journal of Applied Psychology*, 81: 680-693.

White. 2006. *www.simsgeneration.co.uk*

White, H. 1992. *Identity and control: A structural theory of social action*. Princeton, NJ: Princeton University Press.

Williams, J. R. 1994. Strategy and the search for rents: The evolution and diversity among firms. In (eds.) R.P. Rumelt, D. E. Schendel, & D. J. Teece, *Fundamental issues in strategy: A research agenda*, 229-246. Boston: Harvard Business School Press.

Winters, G. 1999. Getting published, *Game Developer Magazine*, March 5.

Winter, S., & Szulanski, G. 2001. Replication as strategy. *Organization Science*, 12:730-744.

Zander, U., & Kogut, B. 1995. Knowledge and the speed of the transfer and imitation of organizational capabilities: An empirical test. *Organization Science*, 6(1): 76-92.

Ziff Davis Game Group, *Digital Gaming in America (DGIA)* **Survey**. (annual publication).

Appendices

APPENDIX I: Role Descriptors for the Interactive Entertainment Industry

1. Hardware Manufacturers

These are the firms which provide the platforms for which game software is created. There are console manufacturers; manufacturers of the personal computer, for which a number of manufacturers across the Apple and PC platforms exist; and manufacturers of portable gaming devices. The market for portables includes handheld gaming devices such as the Game Boy line of products, and manufacturers of mobile communication devices that offer a gaming option, such as the N-Gage. Because the sale of consoles is often discounted heavily to encourage purchase, console manufacturers are compensated usually about $10 in royalties on a per unit basis from game or software sales.

2. Software Firms

Ultimately, when a platform is released, it is the quality and quantity of software in the form of game titles that determines its success. Likewise, software houses are dependent on the installed base of hardware, as this becomes the ceiling for unit sales, to cover costs and make a profit. Before proceeding, I offer the caveat that there is considerable overlap in roles and interactions, because hardware manufacturers generally have in-house software divisions that produce original titles, and publishers can also be developers. However, in a pure sense, games software firms are of two distinct varieties: Game Developers and Game Publishers.

a. *Game Developers*: These entities are involved with the concept, design, art, coding or programming, and testing of a title. In other words, developers create games. Developers can exist in-house at a hardware firm (first-party titles), or independently (third-party titles). Some firms, such as Microsoft, choose to allow their acquired studios (such as Bungie) on a more independent basis, to encourage innovation and retain the unique character that is at the basis of award-winning games (like Halo).

b. *Game Publishers:* As noted, it is not unusual for publishers to have an in-house development division to produce titles. While publishers can be involved with concept and to some extent, game creation, their function is usually limited to business responsibilities, specifically, to produce and distribute titles. Such

responsibilities include management of administrative and strategic efforts such as budgets and schedules, funding, manufacture, distribution, and marketing. Publishing firms have access to a wide variety of experts that generally include producers, market analysts, intellectual property lawyers, game counselors, foreign language translators, and a technical support team. It is not unusual for a publisher who owns a franchise or has the rights to one, to approach and contract with an independent developer to actually create a title in support of that franchise, as Lucas Arts has done in the past with Totally Games. In this case, or in any case where brand and brand image is important, publishers issue specific guidelines to developers and they can become quite involved in game development. Most or all of the financial risk is generally assumed by the publisher and independent developers are advanced monies within the limits of an agreed-upon budget. Developer royalties have a wide range, as Chapter II illustrates, depending on who owns the intellectual property rights, the roles and responsibilities, funding, and reputation. Many funding and partnership concepts that have become familiar from the venture capital industry apply here as well.

3. Entities Engaged in Distribution to the Consumer

1. Technology

The Internet and technologies like broadband are expected to change the way in which products and services are delivered to the customer, the nature of revenue earnings, and gameplay itself. Most importantly, direct distribution to consumers, subscription-based and revenue sharing models, and online gaming are expected to change industry relationships in significant ways over the next few years. Impacts from these changes may include piracy, cheating, and other negative consequences.

2. Retailers

Retailers purchase game hardware and software from publishers, developers, distributors or wholesalers, and other gamers (in the case of used titles) with the intent of reselling to consumers. The market for used titles is considerable due to the mark-ups that are possible, and the demand for lower-priced games. While mark-ups on new games are

generally around 15 percent, used games can command mark-ups of 40 percent or higher (Frederickson et al., 2001)

3. *Distributors*

Distributors tend to be an important channel for publishers and developers who do not have direct access to retailers. Distributors such as Alliance Entertainment, SVG Distribution, MDS Distributors, Regal Games, and Pioneer Distributors tend to be used by smaller firms that usually cannot take on management of retail channels.

4. *Game Rental Companies*

The high price of new games also drove up the market for rentals in the period of the study. Firms like Blockbuster and Hollywood Video were bullish on projected revenue from game rentals, and there were reports that they expected it to reach 20 percent or higher of their total revenue (Goldfield, 2002). Nick Shepherd, Blockbuster's chief concept officer announced in 2002 that game rental revenue was about 12 percent of revenue (Smallwood, 2002). About that time, Blockbuster increased its offering of games, gaming hardware and accessories, and announced an unlimited game rental offer for $19.99 a month. Also, Hollywood Entertainment began expanding its store-within-a-store GameCrazy operation, which specializes in buying, selling, and trading used games.

APPENDIX II: The Market for Hardware

Computer and video games are played on 3 different types of hardware: 1) Personal computers, 2) Game Consoles that require a television or other monitor, and 3) Portables, which are smaller and feature built-in displays. Many revenue reports issued by the game software industry combine consoles and portables, so that convention is followed in this report as well.

Processing power in "bits" determines each generation of consoles and portables. By 2004, portables were 32-bit devices and consoles were 128-bit devices.   Believed to be a limiting software delivery mechanism, the console manufacturers led by Sony abandoned cartridge technology for CD/DVD technology. Many in the industry believe the portables segment would generate much greater demand and profitability if it too made this switch. In spite if this reliance, the portable game software has had significant growth since 1998, when Nintendo introduced the Game Boy Color to the US market.

In terms of share, consoles are the largest contributor to industry revenue, followed by the personal computer and lastly, the portables segment. The console is definitely a more user-friendly device for gaming, self-containing all the power, and most of the accessories the average gamer needs. For the period of the study, Exhibit AII-a below lists the popular video game consoles in the market, and Exhibit AII-b compares the top 3 consoles on a variety of dimensions. Consoles sales have been cyclical in 5-year increments, and although portables are as well, their cycles are expected to last much longer.   Sony, Microsoft, and Nintendo are the 3 major console manufacturers, while Nintendo has dominated the portables segment since 1990 with its Game Boy line of products. The "sweet spot" in terms of price at launch appears to be $300 or less for consoles, so they are usually sold at or below cost, and $100 or less for portables.

Exhibit AII-a: Popular consoles 1996-2003

Year of Release	Consoles
1995	Sony Playstation
1996	Nintendo 64
1999	Sega Dreamcast
2000	Sony Playstation 2
2001	Nintendo GameCube
2001	Microsoft XBox

Exhibit AII-b: Comparative Table for the Current Generation of Consoles

Dimension	Xbox	PS2	GameCube
Processor	Modified Intel Pentium III ○ 733 MHz ○ Maximum bus transfer rate of 6.4 GB per second	128-bit "Emotion Engine" ○ 300 Mhz ○ Floating point unit (FPU) co-processor ○ Maximum bus transfer rate of 3.2 GB per second ○ Includes current PlayStation CPU core	"Gekko" IBM Power PC microprocessor ○ 485 Mhz ○ Cache: Level 1) 32 KB nstruction and 32 KB Data; level 2) 256 KB ○ 32-bit address, 64-bit data bus ○ Maximum bus transfer rate of 2.6 GB per second ○ 0.18 micron copper interconnects
Graphics	Custom nVidia 3-D graphics chip ○ 250 MHz ○ Approximately 125 million polygons[54] per second	"Graphics Synthesizer" ○ 150 Mhz ○ Embedded cache ○ 4 MB VRAM ○ 75 million polygons per second	"Flipper" ATI graphics chip 4. 162 MHz 5. 1 MB embedded texture cache 6. 3 MB Mosys 1T-SRAM Approximately 12 million polygons per second
Audio	○ Custom 3-D audio processor ○ 256 channels ○ Dolby AC3 encoding	○ SPU2 (+CPU) ○ 48 channels ○ 44.1- or 48-kHz sampling rate ○ 2 MB memory	○ Special 16-bit digital signal processor ○ 64 channels ○ 48-kHz sampling rate
RAM	64 MB (Xbox has a unified memory architecture[55], so memory can be allocated to graphics, audio, textures or any other function as needed.)	32 MB RDRAM	40 MB (24 MB 1T-SRAM, 16 MB of 100-MHz DRAM)
Game medium:	Proprietary 4.7-GB DVD	Proprietary 4.7-GB DVD and original PlayStation CDs	Proprietary 1.5-GB optical disc
Controller	Four game controller ports	Two controller ports; "Dual Shock 2" analog controller	Four game controller ports; Wavebird wireless game controller
Other features:	○ Modem/network: Media communications processor (MCP), 10/100-Mbps Ethernet, broadband enabled, 56K modem (optional)[56] ○ 8-GB built-in hard drive[57] 5X DVD drive with movie playback ○ 8-MB removable memory card ○ Expansion port ○ HDTV support	○ Two memory card slots ○ Drive bay (for hard disk or network inteface) ○ Optical digital output ○ Two USB ports ○ FireWire port ○ Support for audio CDs and DVD-Video	○ Two slots for 4-MB Digicard Flash memory cards or a 64-MB SD-Digicard adapter ○ High-speed parallel port ○ Two high-speed serial ports ○ Analog and digital audio-video outputs

Source: http://entertainment.howstuffworks.com/video-game5.htm

---

[54] Polygons are the building blocks of 3D Graphics images. Increasing the number polygons results in sharper, more detailed images.

[55] This makes the Xbox more flexible for game designers

[56] As of November 15, 2002, the Xbox online gaming service was active. It required a broadband connection and a $49.95 subscription to Xbox

[57] Having a built-in hard drive allows games to start up faster.

APPENDIX III: Acquisitions in Interactive Entertainment 1994 - 2004

YEAR	TARGET	ACQUIRER
1994	SSI	Mindscape
1995	Iguana	Acclaim
1995	Rare	Nintendo
1995	Slash	GT Interactive
1995	Sculptured Software	Acclaim
1995	Probe	Acclaim
1995	Papyrus	Sierra
1995	Impressions	Sierra
1995	Bullfrog	Electronic Arts
1996	Manley & Associations	Electronic Arts
1996	Headgate	Sierra
1996	Internet Gaming Zone	Microsoft
1996	Mission Studios	Take Two
1996	Formgen	GT Interactive
1996	Wizardworks	GT Interactive
1996	Humongous	GT Interactive
1996	Mission	Take 2
1996	DMA	Gremlin
1997	Berkeley Systems	Sierra
1997	Maxis	Electronic Arts
1997	Raven	Activision
1997	Odd World	GT Interactive
1997	SingleTrac	GT Interactive
1997	Alliance	Take 2
1998	Homesoft	GT Interactive

YEAR	TARGET	ACQUIRER
1998	Microprose	Hasbro
1998	Atari Assets	Hasbro
1998	BMG Interactive	Take 2
1998	Mindscape	Learning Company
1998	Tiburon Entertainment	Electronic Arts
1998	Head Games	Activision
1998	Broderbund	Learning Company
1998	Sofsource	Learning Company
1998	ABC software	Electronic Arts
1998	Westwood	Electronic Arts
1998	Jack of All Trades	Take 2
1998	Kodiak Interactive	Electronic Arts
1998	Crystal Dynamics	Eidos
1998	Reflections	GT Interactive
1998	OneZero Media	GT Interactive
1998	Talonsoft	Take Two
1998	Learning Company	Mattel
1998	FASA	Microsoft
1999	Legend	GT Interactive
1999	Joytech/LDA Distribution	Take 2
1999	Gremlin	Infogrames
1999	Elsinore Multimedia	Activision
1999	FunSoft Nordic	Take 2
1999	Psygnosis	Infogrames
1999	Accolade	Infogrames

APPENDIX III: Acquisitions in Interactive Entertainment 1994 – 2004 (contd.)

YEAR	TARGET	ACQUIRER	YEAR	TARGET	ACQUIRER
1999	Expert Software	Activision	2001	Pogo	Electronic Arts
1999	CA Verte Italia Spa	Take 2	2001	Ensemble Studios	Microsoft
1999	DMA (Owned by Infogrames)	Take Two	2001	Red Storm	Ubi Soft
1999	Access Software	Microsoft	2001	Techcorp	Take 2
1999	Pacific Coast and Power	THQ	2002	Particle Systems	Argonaut
1999	Triad/GlobalStar	Take 2	2002	Gray Matter	Activision
1999	Neversoft	Activision	2002	Rainbow Studios	THQ
1999	Bungie	Take Two	2002	42-Bit	Warthog
1999	Kesmai	Electronic Arts	2002	Eden Studios	Infogrames
1999	Bottle Rocket	Electronic Arts	2002	Shaba Games	Activision
1999	GT Interactive	Infogrames	2002	Shiny	Infogrames
2000	Dreamworks Interactive	Electronic Arts	2002	Retro Studios	Nintendo
2000	Pixel Broadband Studios	Take 2	2002	ValueSoft	THQ
2000	G.O.D. Games	Take 2	2002	Outrage	THQ
2000	Bungie	Microsoft	2002	Infinity Ward	Activision
2000	Netgames	Microsoft	2002	Z-Axis	Activision
2000	Paradigm Entertainment	Infogrames	2002	Black Box	Electronic Arts
2000	Pop Top	Take Two	2002	Verant Interactive	Sony
2000	LTStudios	Argonaut	2002	Barking Dog	Take Two
2000	Volition	THQ	2002	Incog	Sony
2000	Just Add Monsters	Argonaut	2002	Rare	Microsoft
2000	Neo Software	Take 2	2002	Luxoflux	Activision
2000	VLM Entertainment	Take 2	2002	Treyarch Invention	Activision
2000	Digital Anvil	Microsoft	2002	Massive Entertainment	Vivendi Universal
2000	Hasbro Interactive	Infogrames	2002	Angel Studios	Take Two
2001	Red Zone	Sony	2002	Zed Two	Warthog
2001	Naughty Dog	Sony	2003	Infinity Ward	Activision
2001	Blue Byte	Ubi Soft	2003	Digital Illusions	Electronic Arts

APPENDIX III: Acquisitions in Interactive Entertainment 1994 – 2004 (contd.)

YEAR	TARGET	ACQUIRER
2003	Matrix Semiconductor	Nintendo
2003	Fever Pitch	Warthog
2003	Pivotal Games	Sci
2003	TDK Mediactive	Take 2
2003	Studio 33	Electronic Arts
2004	Wolfpack	Ubisoft
2004	Mobius	Take Two
2004	IO Interactive	Eidos
2004	Surreal Software	Midway
2004	Relic	THQ
2004	Criterion	Electronic Arts
2004	ARUSH	Hip Interactive
2004	Monolith	Warner Brothers
2004	Inevitable	Midway
2004	Venom	Take Two
2004	Digital Illusions	Electronic Arts
2004	Paradox	Midway

APPENDIX IV: Quakecon Community

APPENDIX V: The Sims Community

pogo

You are not currently logged in.
Login with an existing account or register a new account.

Find your international community!

THE EXCHANGE

Everyday Sim players come together here to meet, share ideas, exchange game content, and info about The Sims.

Family Exchange
Download Families, Houses, and Albums

Makin' Magic
Magic Shops and Fantastical Lots

SuperStar
Have the Life of the Rich and Famous

Unleashed
Add a Shop or Cafe

Vacation
Create Your Own Dream Destination

Hot Date
Find a Date and Take Them Downtown

GET THE GAME

Grab A Copy Of The Sims Complete Collection!
You Can Still Get The Game That Started It All!
Order The Sims Today!

ORDER NOW!

THE SIMS 2

In Stores Now
Get the game everyone's talking about!
Find Out More At:
TheSims2.com

EXPAND YOUR EXPERIENCE

Add Cool Stuff To Your Game!
Objects   Updates
Tools   Utilities
Skins   NPCs
Homes   & More

Then Join The Sims Community!
Find Fan Sites or chat with other players

M A X I S   SIMS 2   SIMCITY 4   SIMS ONLINE   The Urbz SIMS IN THE CITY

EA GAMES

E-T   ESRB Privacy Certified click to privacy statement

APPENDIX VI: The Deer Hunter Community

PlanetDeerHunter

Welcome to PlanetDeerHunter

Deer Hunter is one the best-selling game franchises of all time and PlanetDeerHunter is the longest-living resource dedicated to bringing you the very best in Deer Hunter coverage. Whether you're looking for general info, strategies, multiplayer guides, files, discussion among other gamers or just about anything else Deer Hunter related, you'll find it right here at PlanetDeerHunter.

Deer Hunter Game Info

We have tons of content covering the entire world of Deer Hunter. Need some help playing online or just wondering what the heck all those options are and what you can do with them? You'll probably find it here. Pick your poison for further exploration.

- Deer Hunter 5
- Deer Hunter 4
- Deer Hunter 3
- Deer Hunter 2
- Deer Hunter

Deer Hunter Files

- Deer Hunter 5 Demo
  Not sure if you want to purchase Deer Hunter 5? Download the free demo now!

- Deer Hunter 5 1.2 Patch
  If you're upgrading from a fresh installation of Deer Hunter 5, upgrade to the latest version with this file.

- Deer Hunter 5 1.1 to 1.2 Patch
  Users who've already applied the patch from retail to 1.1 should download this file for the latest version of DH5.

- Deer Hunter 4 1.1b Patch
  Just installed Deer Hunter 4? Make sure to upgrade your game to the latest version with this download.

- Deer Hunter 4 1.1 to 1.1b Patch
  Users with the 1.1 patch will want to download this file to have the latest version of Deer Hunter 4.

- Deer Hunter 3 Files
  Download patches and the demo from the oldie-but-still-goodie, Deer Hunter 3.

Sidebar navigation

Subscribe
Disable Ads
Join Today!

Planet.DeerHunter
Home
Discussion
Downloads
Guides & Tips

Deer Hunter 5
Game Info
Requirements
Discussion
Downloads
Media
Multiplayer

Deer Hunter 4
Game Info
Requirements
Guides & Tips
Multiplayer
Discussion
Downloads

Deer Hunter 3
Game Info
Requirements
Guides & Tips
Multiplayer
Discussion
Downloads
Media

Deer Hunter 2
Game Info
Requirements
Guides & Tips
Articles
Multiplayer
Discussion
Downloads

Deer Hunter
Game Info
Requirements
Guides & Tips
Discussion
Downloads

Planet Network
GameSpy
GameSpy.com
Founders' Club
GameSpy Arcade
GameSpy 3D
GameSpy Store
Services
FilePlanet
ForumPlanet
Action
ICAction Planet
Planet A/F
Planet Battlefield
Planet CallofDuty
Planet DOOM
Planet Duke
Planet Far Cry
Planet GTA
Planet HalfLife

APPENDIX VII: Illustration of Creator Centrality

Exhibit AVII-a: Creators with High Betweenness Centrality

Exhibit AVII-a Creators with High Betweenness Centrality (Contd.)

Moby Games*

Game Developers
Conference

Game Browser | Forums | News | Quick Search: [   ] | More Searches   Become a Sponsor

All Games

User Actions
Contribute

Rap Sheet
Main Summary
Portraits
Biography

Gameography
Chronological
By Role
By Genre
By MobyScore

Other
Submit News Item
Advertise With Us
The MobyStore
Tips & Tricks
Friends of Moby
ChangeLog
Contact Us
FAQ

Buy
Moby
Games
Stuff!

John Carmack

Developer BIO

John Carmack was born on August 20th, 1970 and is a prolific figure in the video game industry. His most recognized achievements have been his co-founding of id Software, and the programming of Wolfenstein 3D, Doom, and Quake. He has invented many graphic algorithms including "surface-caching".

John Carmack is also an avid rocketry enthusiast and founded Armadillo Aerospace, which has competed for the ANSARI X Prize. After the prize was won, the company, led and largely funded by Carmack, is looking towards orbital spaceflight.

[edit bio]

Websites

* John Carmack's Blog -- General interest stuff, but a bunch of things will only be of interest to hardcore graphics geeks

[add website]

Games Credited
Doom 3: Resurrection of Evil (2005), Activision Publishing, Inc.
Doom 3 (2004), Activision Publishing, Inc.
Commander Keen (2001), Activision Publishing, Inc.
Quake III: Revolution (2001), Electronic Arts Inc.
Serious Sam: The First Encounter (2001), Gathering
Throne of Darkness (2001), Sierra On-Line, Inc.
Quake III: Team Arena (2000), Activision Publishing, Inc.
Kingpin: Life of Crime (1999), Interplay Entertainment Corp.
Quake III: Arena (1999), Activision Publishing, Inc.
Quake II Mission Pack: Ground Zero (1998), id Software, Inc.
Quake II Mission Pack: The Reckoning (1998), Activision, Inc.
Doom 64 (1997), Midway Games
Quake II (1997), Activision, Inc.
Quake Mission Pack No. 1: Scourge of Armagon (1997), id Software, Inc.
Quake Mission Pack No 2: Dissolution of Eternity (1997), id Software, Inc.
Final Doom (1996), GT Interactive Software Corp.
Quake (1996), id Software, Inc.
Descent (1995), Interplay Productions, Inc.
Hexen: Beyond Heretic (1995), id Software, Inc.
The Ultimate Doom (1995), GT Interactive Software Corp.
DOOM II: Hell on Earth (1994), GT Interactive Software Corp.
Heretic: Shadow of the Serpent Riders (1994), id Software, Inc.
Rise of the Triad: Dark War (1994), Apogee Software, Ltd.
Doom (1993), id Software, Inc.
Catacomb 3-D (1992), Gamer's Edge, Softdisk Publishing
Night Raid (1992), Software Creations Ltd.
Spear of Destiny (1992), FormGen, Inc.
Wolfenstein 3D (1992), Apogee Software, Inc.
Commander Keen 4: Secret of the Oracle (1991), Apogee Software, Ltd.
Commander Keen 5: The Armageddon Machine (1991), Apogee Software, Ltd.
Commander Keen 6: Aliens Ate My Baby Sitter! (1991), FormGen, Inc.
Dangerous Dave in the Haunted Mansion (1991), Softdisk Publishing
Dark Designs II: Closing the Gate (1991), Softdisk Publishing
Hovertank (1991), Softdisk Publishing
Keen Dreams (1991), Softdisk Publishing

Portrait

Carmack (left) with Seumas McNally, next to Carmack's famous Ferrari

[more shots | add portrait]

http://www.mobygames.com/developer/sheet/view/developerId,682

Page 1 of 2

Cass Business School. London   203   Richardson. S.A./Thesis/Nov032006

Exhibit AVII-b: Creators with High Degree Centrality

Moby Games

GameDevelopers
Conference

Game Browser | Forums | News | Quick Search: [_____] | More Searches...

Become a Sponsor

All Games

Will Wright

Portrait

Circa 1999

[more shots | add portrait]

Developer BIO

Will Wright is one of the greatest game designers of all time. Despite the tragic death of his father when he was young, he managed to motivate himself to make great games. His first game, Raid on Bungeling Bay, published by Broderbund for the Commodore 64, was a helicopter action game. He also worked on an unreleased game called Probots for the Commodore, which he would like to remake if he could find a copy of it (he lost all of them). Raid on Bungeling Bay gave him the idea for SimCity, when he was having more fun building the levels than flying around in them. This led him and Jeff Braun to found Maxis, one of the greatest development studios in gaming history.

[add bio]

Websites

- Biography of Will Wright -- Featured on ActiveGaming.net and written by Eric Hysen on April 29, 2004

[add website]

Games Credited

Psychonauts (2005), Majesco Entertainment Company
The Sims 2 (2005), Electronic Arts Inc.
The Sims 2 (2005), Electronic Arts Inc., Maxis Software Inc.
The Sims 2 (2005), Electronic Arts Inc.
The Sims: Mega Deluxe (2004), Electronic Arts Inc.
The Urbz: Sims in the City (2004), Electronic Arts Inc.
The Urbz: Sims in the City (2004), Electronic Arts Inc.
SimCity 4 (2003), Electronic Arts Inc.
The Sims: Bust n' Out (2003), Electronic Arts Inc.
The Sims: Makin' Magic (2003), Electronic Arts Inc.
The Sims: Superstar (2003), Electronic Arts Inc.
The Sims (Deluxe Edition) (2002), Electronic Arts Inc.
The Sims: Online (2002), Electronic Arts Inc.
The Sims: Unleashed (2002), Electronic Arts Inc.
SimCity 3000 Unlimited (2000), Electronic Arts Inc.
The Sims (2000), Electronic Arts Inc.
Seaman (1999), Vivarium
SimCity 3000 (1999), Electronic Arts Inc.
Marble Drop (1997), Maxis Software Inc.
SimCopter (1996), Electronic Arts Inc.
SimIsle: Missions in the Rainforest (1995), Maxis Software Inc.
SimTower: The Vertical Empire (1995), Maxis Software Inc.
SimTown (1995), Maxis Software Inc.
SimCity 2000 Urban Renewal Kit (1994), Maxis Software Inc.
SimCity Classic (1994), Maxis Software Inc.
Empire Deluxe Scenarios (1993), New World Computing, Inc.
SimCity 2000 (1993), Maxis Software Inc.
SimCity Enhanced CD-ROM (1993), Interplay Entertainment Corp., Maxis Software Inc.
A-Train (1992), Maxis Software Inc.
A-Train Construction Set (1992), Maxis Software Inc., Orion Software Ltd.
SimLife (1992), Maxis Software Inc.
RoboSport (1991), Maxis Software Inc.
SimAnt: The Electronic Ant Colony (1991), Maxis Software Inc.
SimEarth: The Living Planet (1990), Maxis Software Inc.
SimCity (1989), Broderbund Software, Inc.
SimCity, Terrain Editor (1989), Infogrames
Raid on Bungeling Bay (1984), Broderbund Software, Inc.

Ads by Go000oogle

Game Development
Only Complete Listing
Of Outsource
Providers For Gaming.
Learn More!
www.OutSourceReport.c

Custom Flash Games
Advanced Flash
Developers Create
Games To Your
Specification
www.nexgui.com/
services_game

Exhibit AVII-b Creators with High Degree Centrality (Contd.)

Moby Games

Game Browser | Forums | News | Quick Search: [____] | More Searches | Become a Sponsor

All Games

User Actions
Contribute

Rap Sheet
Main Summary
Portraits
Biography

Gameography
Chronological
By Role
By Genre
By MobyScore

Other
Submit News Item
Advertise With Us
The MobyStore
Tips & Tricks
Friends of Moby
ChangeLog
Contact Us
FAQ

Joeyray Hall

Developer BIO

There is no biography on file for this developer.

[add bio]

Also Known As

- Joey Ray Hall

Websites

There are no related websites on file for this developer. If you know of any related websites for the person, please consider contributing them.

[add website]

Games Credited

World of Warcraft (2004), Blizzard Entertainment Inc.
Warcraft III: The Frozen Throne (2003), Blizzard Entertainment Inc.
Warcraft III: Reign of Chaos (2002), Blizzard Entertainment Inc.
Warcraft III: Reign of Chaos (Collector's Edition) (2002), Blizzard Entertainment Inc.
Diablo II: Lord of Destruction (2001), Blizzard Entertainment Inc.
Diablo II (2000), Blizzard Entertainment Inc.
Diablo II (Collector's Edition) (2000), Blizzard Entertainment Inc.
Warcraft II: Battle.net Edition (1999), Blizzard Entertainment Inc.
StarCraft (1998), Blizzard Entertainment Inc.
StarCraft: Brood War (1998), Blizzard Entertainment Inc.
Warcraft II: The Dark Saga (1997), Electronic Arts Inc.
Diablo (1996), Blizzard Entertainment Inc.
Justice League Task Force (1995), Acclaim Entertainment, Inc.
Warcraft II: Tides of Darkness (1995), Blizzard Entertainment Inc.
BlackThorne (1994), Interplay Productions, Inc.
Warcraft: Orcs & Humans (1994), Blizzard Entertainment Inc.
Rock n Roll Racing (1993), Interplay Productions, Inc.
The Lost Vikings (1992), Interplay Productions, Inc.

Portrait

If you have a portrait of this person, you can upload it to the MobyGames database.

[add portrait]

Exhibit AVII-c: Creators of Top Games with Low Centrality

MobyGames

GameDevelopers
Conference

Game Browser | Forums | News | Quick Search: | More Searches   Become a Sponsor

All Games

User Actions
Contribute

Rap Sheet
Main Summary
Portraits
Biography

Gameography
Chronological
By Role
By Genre
By MobyScore

Other
Submit News Item
Advertise With Us
The MobyStore
Tips & Tricks
Friends of Moby
ChangeLog
Contact Us
FAQ

James Ryan Boer

Developer BIO

There is no biography on file for this developer.

[add bio]

Websites

There are no related websites on file for this developer. If you know of any related websites for the person, please consider contributing them.

[add website]

Games Credited
Digimon Rumble Arena 2 (2004), Bandai Co., Ltd.
Lemony Snicket's A Series of Unfortunate Events (2004), Activision Publishing, Inc.
Disney/Pixar's Finding Nemo (2003), THQ, Inc.
Tex Atomic's Big Bot Battles (2001), Real Networks, Inc.
Deer Hunter (1997), WizardWorks Software

Portrait

If you have a portrait of this person, you can upload it to the MobyGames database.

[add portrait]

**Buy
Moby
Games
Stuff!**

http://www.mobygames.com/developer/sheet/view/developerId,31882/   Page 1 of 1