The Video Game Industry
An Industry Analysis, from
a VC Perspective

Nik Shah T'05
MBA Fellows Project

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- **The video game industry is poised for significant growth, but many sectors have already matured.** Video games are a large and growing market. However, within it, there are only selected portions that contain venture capital investment opportunities. Our analysis highlights these sectors, which are interesting for reasons including significant technological change, high growth rates, new product development and lack of a clear market leader.

- **The opportunity lies in non-core products and services.** We believe that the core hardware and game software markets are fairly mature and require intensive capital investment and strong technology knowledge for success. The best markets for investment are those that provide valuable new products and services to game developers, publishers and gamers themselves. These are the areas that will build out the industry as it undergoes significant growth.

A Quick Snapshot of Our Identified Areas of Interest

- **Online Games and Platforms.** Few online games have historically been venture funded and most are subject to the same "hit or miss" market adoption as console games, but as this segment grows, an opportunity for leading technology publishers and platforms will emerge. New developers will use these technologies to enable the faster and cheaper production of online games. The developers of new online games also present an opportunity as new methods of gameplay and game genres are explored.

- **Wireless Games.** Mobile gaming is projected to be a large market in the coming years and this has led to its identification as a "hot" VC segment. It has seen a lot of financing and consolidation activity recently, so while we still see opportunity, we believe that it may be approaching the saturation point of initial funding and should be entered carefully. A follow-on investment in a market leader is likely

the best strategy for entry at this point, until software standards are set and an initial shakeout occurs.

- **Communications.** Massively Multiplayer Online Games (MMOGs) involve players scattered in all geographies. Thus, the communication tools within games are important for both interacting during play and recruiting players for a game session. Most of these tools are currently embedded within games themselves, but a few standalone tool suppliers are emerging and we believe that "best of breed" and technology agnostic solutions will win the market.

- **Advertising / Content and Other Services.** The growth of games has led to their adoption as a marketing tool, and we believe this will continue throughout all segments of gaming, including console, PC, online and wireless games. All forms of marketing, including both "advergaming" and product placements represent areas of opportunity since one of the most sought after advertising demographic groups are now the primary gamers. Other services, such as product exchange, will also grow as the online/MMOG market, in particular, grows.

- **Enabling Software.** The software toolkits and platform software used by all types of game developers is a disparate and under funded market. We believe it is poised for growth as game technology advances particularly in the mobile gaming segment. Advanced toolkits both reduce the cost of game development and increase the sophistication of games.

- **Enabling Hardware.** While some graphics and sound chip sectors are mature (consoles, PCs), opportunity still lies in the emerging hardware sectors (wireless, handheld) for technologically advanced semiconductors with the appropriate small formfactor. Hardware and software standards have yet to be set in these sectors and are thus open for new entrants.

Table of Contents

Introduction

Our goal in this report is to describe and analyze the video game industry. We do so from the point of view of a venture capital firm, and therefore look to identify opportunities where new entrants, such as venture-backed startups, can gain market leadership or have a significant impact.

Our methods and approach

We start with a recap of the industry's history and then break the industry into four major sub-sectors: hardware, software, infrastructure and enabling technologies. Each of these sub-sectors itself has segments that vary in maturity and interest level for venture investing. We have developed a framework to analyze each component and determine how strong the potential is for startup and VC investor success. For example, personal computers, which serve as the core hardware for much of today's online and offline gaming, is a mature, highly competitive and capital intensive industry, which led to a low interest level. In contrast, wireless gaming is a less established industry where opportunity still exists for a number of reasons, including technology change, lack of market leadership and overall market growth.

We detail the low interest segments first and then proceed to those that present an opportunity for VC investment. Each segment that has a high interest level is then examined to detail market drivers and potential sources of competitive advantage. We profile interesting companies in each segment and present what we believe are the key factors that will eventually determine the winners in a segment and identify those companies where appropriate.

History of Video Games

Early history and eventual entrance of Nintendo

The idea for the first video game was sparked in 1951 when Ralph Baer, then an engineer with Loral, was given the task of developing the best television in the world. Baer's idea was to include some interactive game with the television, but management did not wish to pursue the idea. In the late 1950's and early 1960's the first video games were developed in laboratories and universities during scientists' and students' spare time. Willy Higinbotham designed a table tennis game to keep visitors at the Brookhaven National Laboratories entertained, while at a similar time MIT student Steve Russell developed Spacewar on a minicomputer. During the late 1960's Ralph Baer resumed his pursuit to develop a game, this time succeeding in creating an interactive game that could be played on a television screen. In 1968, Baer's game was patented.[1]

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[1] http://www.gamespot.com/gamespot/features/video/hov/p2_01.html

Two different events in the 1970's were catalysts that moved the video game industry towards mainstream America. In 1971 the first arcade game was released. While the game was considered difficult to play, a seed was planted with the public. In 1972 Magnavox began producing the Odyssey, which was the first home television game system. The Odyssey system came with several game cartridges, all playing some version of table tennis. More importantly, however, Pong was released in 1972. The Pong "stand alone" units that were placed in bars and taverns were tremendously successful. In 1977 Atari released their Video Computer System (later called the 2600) to great results. Finally, in 1978, Nintendo entered the industry with the release of several arcade games.[2] The nascent console age had begun.

The first large wave of American adoption

Arcade games usher in the "video game" age

The 1980's were the start of the modern video game era with the release of two hugely popular and successful games – Namco's Pac Man and Atari's Space Invaders. One factor that contributed to the success of the home gaming system was the triumph of the arcade. Specifically, US arcades generated revenues in excess of five billion dollars in 1981 alone.[3] The next major console was released in 1982 with the debut of Colecovision. A large part of Colecovision's success can be attributed to the game licenses obtained from Nintendo, specifically Donkey Kong and Donkey Kong Junior. Following a lull through much of the mid-1980's, Nintendo shook up the video game industry with the release of their 8-bit Entertainment System (NES) in 1986. Following the release of NES, Nintendo dominated the industry through the rest of the 1980's with huge hits like Super Mario Brothers and Tetris. In 1989 Nintendo created a new market segment with the release of a hand held gaming system called Game Boy. However, as 1990 was approaching, Nintendo was facing new competition from Sega and the release of their 16-bit Genesis system.

The 16-bit system lasted about five years, until 1994 when Sega released the 32x, which was an adapter placed on the Genesis that allowed it to run 32-bit cartridge games. For the most part, however, console companies decide to largely bypass the 32-bit machine, and work towards the release of 64-bit consoles in the mid-1990's. The one notable exception is the 3DO, which was developed by a company called 3DO, but licensed and manufactured by Panasonic, Goldstar and Sanyo. While the 3DO initially received strong reviews, the $699 price target proved prohibitive and resulted in limited success for both the 3DO company and its licensees.[4] The year 1995 was a turning point in the console space as Sony entered the market with their 32-bit Playstation one. Sony entered the space with a price of $299 and quickly became the market leader. The following year

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[2] http://www.videogames.org
[3] http://www.gamespot.com/gamespot/features/video/hov/p4_02.html
[4] http://www.gamespot.com/gamespot/features/video/hov/p8_01.html

Nintendo released the N64 following tremendous success in Japan. The cycle of improved consoles continued to move quickly as Sega released the Dreamcast, a 128-bit system in 1999.

Sony and Microsoft push the technology further

Nintendo and Sega are marginalized by more advanced technology

The release of the 128-bit Playstation 2 in 2000 and Microsoft XBox in 2001 brought the console market to its current state. The Playstation 2 released in 2000 was met with unbelievable frenzy and anticipation. Due to tremendous demand, consoles were extremely difficult to find in stores. As a result the $299 game could be found on eBay for over $1,000.[5] In less than a year, Sony sold over ten million Playstation 2 consoles. The release of XBox was noteworthy because it signified software giant Microsoft was serious about entering the console gaming space. XBox was also met with success. In the 128-bit console space in early 2005, Playstation is the dominant player, followed by XBox then Nintendo. It is interesting to note that the console industry has evolved into a relatively predictable four to five year cycle of renewal. As this paper is being written in early 2005, rumors swirl about the release of the next XBox (expected in late 2005) and Playstation 3 (expected in early 2006). Clearly, Microsoft hopes to gain some ground on Sony by releasing their next generation console earlier.

While the console space has become somewhat predictable, online gaming offers tremendous growth potential within the video game space. In the mid 1990's several research firms were predicting that online gaming would be a billion dollar industry by 2000 (Jupiter Communications predicted $1.6 billion, Forrester Research predicted $1.6 billion by 2001 and Kagan predicted $1.375 billion in 2000).[6] While the online gaming space has not yet reached these projections (revenue was about $200 million in 2000), the space is growing rapidly and offers exciting potential to both gamers and investors. The growth of online gaming is just one of the potential areas of opportunity for venture capital investing, as we will detail in the rest of our analysis. First, however, we will detail the major trends that are driving the growth in the video game industry.

Overview of Industry Growth Trends

The video gaming industry has grown significantly in recent years due to a number of technology and consumer trends:

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[5] http://www.gamespot.com/gamespot/features/video/hov/p10_03.html
[6] The Future of Online Games, Greg Costikyan

Growth of Broadband

The adoption of high-speed internet through either DSL or cable modem connection services has increased the accessibility of online gaming, such as massively multiplayer online gaming (MMOG). Online gaming, whether through consoles or PCs, requires a high speed connection, something which many households had not had until recently.

Cheapness of Computing Power

As processors have dropped in price, both consoles and PCs have added high-end CPUs and graphics chips. All gaming hardware is now fast enough to meet any requirements that game developers may have. Processing power is no longer a restraint in the development of more advanced graphics and sounds in games.

All of these various drivers are fueling the industry's recent and projected expansion

Adoption of More Robust Wireless Networks and Phones

Wireless carriers are deploying high-speed, next-generation networks. These networks, in conjunction with more advanced phones that have multimedia capabilities, have enabled the delivery of data services such as games and ring tones to cellular phones.

Maturing of the Consumer Base

According to the Entertainment Software Association, the average age of a gamer is 29 years old. This means that the average gamer has more disposable income than he had historically, when gamers were typically children. Additionally, with more adults playing games, they will spend more years in the target demographic. This shift in demographics has led to an expansion of the market.

Each of the trends listed above has led to growth in the overall video game market. Further expansion is likely in the coming years as new platforms for gaming such as cellular phones emerge.

The growth in the industry has also led to the consolidation detailed below as leading companies strive to control more of the profit in the industry. In particular, the market for console games has undergone some structural changes.

The Rise of Exclusives in the Game Sector

There have been a number of recent moves in the game space that has led to its consolidation. This trend may lead to a small number of players

Maturation of the industry has also driven consolidation

controlling the software sector, similar to the console sector. Electronic Arts has recently signed exclusive deals with the NFL and ESPN and also purchased nearly 20% of Ubisoft, a French game developer. Ubisoft itself just recently announced a deal to purchase several of Microsoft's sports games. This industry consolidation and tie-up of exclusive licenses is likely to decrease competition and lead to an oligopoly structure in PC and console gaming similar to that of hardware, with EA the likely market leader.

Game Developer and Publisher Consolidation

As described in the Video Game Software section below, publishers and developers have historically been two separate parts of the game development process. This has changed in recent years as many large publishers have been on acquisition sprees of development firms. The publishers gain development expertise, proprietary technology, intellectual property and a competitive advantage from these acquisitions and prevent other publishers from access to the technology and content that the best developers offer. Development shops, which are typically private and owned-run, get liquidity from the transactions. They also get more resources to keep up with technology change, manage growth and do more extensive marketing of their products. The acquisitions have consolidated the industry particularly as publishers have grown in size as public companies and look for more sources of profit.

We anticipate that this trend of consolidation will spread across other segments of the video game industry. Previously niche industries will undergo growth and turn profitable lifestyle businesses (which were market leaders) into diversification opportunities for public game companies. There is currently fragmentation in many of the video game market segments and we expect that some acquisitive companies will strive to enter and dominate those market opportunities.

Industry Analysis

Keeping these trends in mind, we now turn to our analysis of the industry. In order to facilitate this study, we have split the video game industry into four major sectors, as defined below: Hardware, Video Game Software, Infrastructure and Enabling Technology.

- *Hardware*: the device that the game is physically played on

- *Video Game Software*: the game itself

- *Infrastructure*: the underlying support mechanisms to distribute or play the game

- *Enabling Technology*: the supporting technology that creates the overall gaming experience

Each sector is an integral part of the industry and intertwines with the others. Within each sector, we have also identified numerous sub-segments. It is within these segments that we will look for interesting market opportunities and investment ideas. In order to do this screen for investment ideas, we used the following framework to look at each sector.

Framework for Industry Screen: a variant on Porter's Five Forces

This framework is similar to Porter's Five Forces, but is slightly different as it focuses on barriers to entry and the ability of new entrants (namely startups) to gain market share or impact an industry. The four main components we looked at are as follows.

Figure One – Industry Screen

Our "Venture Interest" screen had four main components

Growth Rate: (Must provide opportunity to gain share quickly)

- Is the sector growing significantly?

- Is it mature or still nascent?

Competitive set: (Must be able to enter for low cost and gain share with non-predatory competition)

- Is it dominated by large companies?

- Is it a capital intensive or installed base intensive sector?

- Is brand a large barrier to entry (how high are barriers to entry)?

Technology change: (New innovation must be a good means to gain entry)

- Is it undergoing significant technology change?

- Are standards established, or still uncertain?

Supplier and Distribution/Customer influence: (Larger companies with power in the supply chain make capturing value difficult)

- How strong is the power of partners?

- Will it be difficult or costly to get top quality suppliers or gain core customers and design wins, etc?

Part I: Low Interest VC Investment Sectors

We applied our framework to the four major sectors of the video game industry and identified several areas of low and high interest. First we will describe the sectors of lower interest and then do an in-depth analysis of the sectors we believe present an opportunity for Venture Capital investment.

Hardware

We have defined Hardware to encompass the device on which the game is played. Hardware is typically a commodity entity in the sense that it adds little value to the game. Most of the end hardware markets are also mature, and have had a competitive shakeout.

Personal Computers

The PC industry is too price competitive and mature for venture investment.

PCs are the hardware on which non-online PC games and Massively Multiplayer Online Games (MMOG) are played. There are many manufacturers of personal computers, including **Dell**, **HP**, **Apple** and **Lenovo** and it is nearly a $200 billion market. The users of personal computers, however, are varied and gaming is not typically a central usage, though that is changing. Overall, the PC industry is highly competitive and has a slowing growth rate. Over the past years there has been significant consolidation and shakeout (as exemplified by the HP-Compaq merger and IBM's sale of its PC unit to Lenovo). Opportunity in this market may exist for new entrants who are able to compete on price due to a cost advantage (such as how Dell gained market share via supply chain efficiency), however, sizeable capital will be needed for that entry and the current margins of the industry make it unattractive for most pure-play entrants. For these reasons, there is not significant opportunity for a gaming focused company to participate in this market as a supplier of personal computers. This aspect of hardware is on the path to commoditization.

Gamer customized PCs is an area that could be viewed as a new trend, but in addition to current players in the market (such as **Alienware**) it is hard to see unique value being created. Many of the gamer-valuable components, such as graphics and sound cards can be purchased at the local electronics store and installed in a standard PC with ease.

Game Consoles

Game Consoles are an area of low interest as it requires extensive technology and capital investment for success.

Game consoles are computing devices that are designed primarily to play games, which come on interchangeable discs or cartridges. Today, they are typically CD/DVD format based, but the type of game cartridge has varied over the years. **Sony**, **Microsoft** and **Nintendo** are the major players in the market today, with approximate market shares of 56%/27%/17% in the US ($1.8 billion market), and 67%/19%/13% worldwide ($4.6 billion)[7]. While Sony and Microsoft compete directly in the teen to adult gaming segment, Nintendo has moved its product towards the younger segment and does not compete with the others as much. These consoles are relatively immobile and typically connected to a TV. This

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[7] Wedbush Morgan Securities, The Definition of Insanity

market is highly competitive and requires significant capital for entry. Sega, which had notable market share in the early to mid-1990s, exited the console business in 2001 as it was unable to keep up with current technology and Sony's domination following their entry into the business in 1999. In fact, since Nintendo and Sega popularized consoles in the late 1980's, only Sony and Microsoft have been able to enter successfully, although others have tried (3DO, Atari, etc.). Sony and Microsoft's technology know-how and marketing resources gave them the advantage to enter the market and dominate it. Technology changes with each generation of consoles, so relationships with suppliers such as CPU and graphics chip makers are critical. Without similar resources, it will be difficult for a new player to repeat such an entry. New entrants would also have to face the battle of an installed base of users and software that market incumbents possess. Sony and Microsoft also had arguably weaker foes (Nintendo and Sega) to defeat than an entrant today would have.

Handheld Consoles

Handheld consoles are mobile devices which, similar to game consoles, have multiple games and for which the predominant intended use is gaming. As multiple use hybrid devices proliferate, this definition changes, but the devices we refer to here are thought of gaming devices centrally. Examples of this are the **Nintendo** GameBoy products, the **Nokia** N-Gage (which is also a cellphone) and the **Sony** PSP (which is predicted to also have other uses). These are generally thought to be a mobile version of a game console.

Handheld consoles are of medium interest – with a truly hybrid device representing a potential opportunity. Otherwise, low interest

Nintendo is the dominant player in this area, with its GameBoy line of products. Currently Nintendo has nearly 100% market share in the US ($900m market[8]). This is expected to be threatened however, upon Sony's upcoming launch of the PSP. Nintendo's response to the PSP, the Nintendo DS (dual screen) was recently launched in the US and is compatible with older GameBoy games, giving Nintendo a strong installed base. Based on analyst projections, these two players are expected to split the market going forward with limited market share for the Nokia N-Gage.

The downfall of the N-Gage is that it is a hybrid that does not successfully fulfill either of its two uses. The dynamics of this market are similar to those in console gaming, where significant capital and infrastructure are needed to challenge the market entrants. Tapwave, however, is a startup that is challenging the incumbents in the market. With the launch of their Zodiak handheld last year based on the Palm OS platform, they are attempting to sell a combination gaming/music/organizer device. The company was founded by former executives of Palm, Inc, and the product interface and layout is more similar to a Palm handheld than a gaming

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[8] ibid.

device. However, as the product does have a graphics chip, it is aimed at serious gamers. Given its recent introduction, its adoption rate is uncertain, but should be watched as a sign of whether hybrid devices, which have typically failed in the past, can find a niche in the market.

Wireless/Cell phone Devices

The cell phone market is dominated by the customers (carriers) and is becoming a commodity - low interest

Cell phones have had games pre-installed on them for years, but most games have been fairly basic and individual. Recently, though, this has changed with the advent of wireless data services and advanced gaming. Thereby, the cell phone is increasingly used as a gaming device platform. While the software market is still nascent, cell phones themselves are an established market with 684 million units sold in 2004, representing approx. $70 billion (according to Strategy Analytics). Similar to the other devices described above, the market is controlled by a handful of players, namely **Nokia**, **Samsung**, **Motorola**, and **Sony Ericsson**. Each of these companies has relationships with existing carriers, component suppliers and other retailers. Thus, new entry into the market without these relationships is difficult, particularly on the carrier side. Cellular phones continue to evolve with the addition of new features, such as cameras and other advanced functionality. However, the cost of entry for a new company is high and there seems to be limited opportunity.

Overall, hardware markets are fairly mature and highly competitive. It appears hard for a company without established relationships, lots of capital and a true technology advantage to compete. We see the only area of interest to be in hybrid devices, but also believe that the strong ease-of-use demands for such devices has led to the multiple failures in the market and the continued failure of most entrants.

Video Game Software

***Developers and Publishers are the two groups that create games***

In 2003, video game software sales across all gaming platforms exceeded eleven billion dollars. For the last three years game sales have generated more revenue than Hollywood, as box office revenues in 2003 were approximately nine billion.[9] The game software segment of the video game industry is ruled by two major segments, the developers and the publishers. While both play a key role, major international publishers like **Electronic Arts** rule the industry in PC and console gaming, so we will examine that market first. (In this report, we define PC games as non-online PC games)

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[9] http://www.redherring.com/Article.aspx?a=4930&hed=Indie+game+developers+get+cutthroat

Publishers – Console/PC/Handheld

The publishers generally commission and pay for the development of a game, in much the same way that a television channel works with a production company to create a program.[10] Because publishers have the finances to fund the majority of projects, they control which products reach the market, on what formats, and at what time of the year the games are released. Beyond commissioning the games, publishers often handle the marketing and distribution of games. Production includes the creation and manufacturing of the components, while distribution requires negotiating deals with retailers to get the title to consumers. Figure Two below illustrates the video game software value chain.

Figure Two – Video Game Software Value Chain
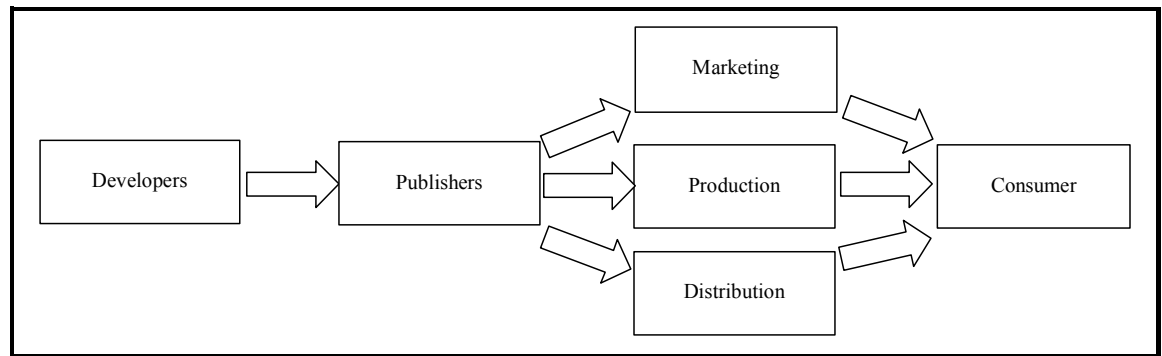
Console/PC/Handheld Development and Publishing are low interest

As a simple example of how the relationship between publisher and developer works consider the following. The developer gets a five million advance to create the game and ten percent royalty based on the publisher's revenue following deductions. The developer will see royalties after the game has generated fifty million in revenue for the publisher. If a game sells for $30, it must sell one million units before the developer sees royalties.[11]

The video game software industry is dominated by large, international publishers, none more so than Electronic Arts (EA). Over the past three years the average company in the industry has seen an 8% increase in their stock price, while at the same time EA has increased by 123%.[12] The following example shows the strength of position that EA holds. At the end of 2004, EA felt that it had lost market share to Take-Two Interactive and Sega Corporation's ESPN NFL 2K5, a game in direct competition with EA's Madden Football (the Madden franchise has generated over $1 billion in revenue over the last fifteen years). NFL 2K5 was aggressively priced at $19.95, less than half of EA's title, basically resurrecting the

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[10] http://www.obscure.co.uk/publishing.shtml
[11] http://www.redherring.com/Article.aspx?a=4930&hed=Indie+game+developers+get+cutthroat
[12] DFC Intelligence Game Industry Brief

ESPN football title.[13] To counter this move by Take-Two, EA acquired the licensing rights of the NFL for all developing, publishing and distribution of interactive football games. This type of maneuvering is why we think this is a difficult segment for start ups. EA essentially locked out other publishers from producing NFL games for the next five years, in similar fashion to deals EA has with professional soccer and golf (Tiger Woods). Because this industry is very mature and dominated by large international players, we feel that there is little opportunity for venture backed companies. It takes an enormous amount of capital to lock up the increasingly exclusive content and without such deals it will be hard for publishers to compete. Additionally, publishing is a segment characterized by strong relationships (with developers and retail outlets) and starting from scratch without these relationships would be extremely difficult. Further, there has been a large amount of consolidation in the market and starting a new console or PC game publisher is unlikely to be a lucrative business.

Developers – Console/PC/Handheld

Software developers create the games that consumers will eventually play. The majority of software developers are independent companies, but some of the larger publishers have internal development teams or own a stake in external developers. In general the development process involves design, research, implementation, testing, and mastering. Games fall into three main categories, licenses, conversions, and originals, with developers tending to specialize in one segment. A licensed game is based on intellectual property that the publisher generally owns or has bought the rights to. A conversion is a game that has been developed for one game platform and converted to another. Finally, original games are based on a developer's concept. The majority of original ideas are created by independent publishers, who then try to get the game signed by a publisher. Original games are generally cheaper to produce because there is no licensing fee, but are riskier because of the uncertain consumer response to a new product.

PC/Console game development is a "hits" business, like movies

There are roughly 200 independent video game developers in the US today, with most working under the typical structure of an advance from a publisher as discussed above.[14] This space is also dominated by the large publishers like EA who either control the game flow or develop games internally. Software development in the video game industry is an area likely to continue to grow at a strong pace, particularly in late 2005 and early 2006 as new consoles are released (expected U.S. and European CAGR of 12%).[15]

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[13] Wall Street Journal, 12/14/04 "Electronic Arts Acquires Rights to Produce NFL Games"
[14] http://www.redherring.com/Article.aspx?a=4930&hed=Indie+game+developers+get+cutthroat
[15] Wedbush Morgan Securities, The Definition of Insanity

In addition to the maturity of the industry, the sector is characterized by a "hit or miss" structure with creates significant challenges. A single game can cost in excess of ten million dollars to develop, requiring hundreds of thousands of units sold to recoup this investment. Because this is a hits business (many of the most successful games are franchises with developed consumer loyalty), and game sales are subject to consumer tastes, entering the market is extremely challenging and risky. Because of the high cost of developing games, the low success rate and new technology innovation around the corner, console, PC, and handheld software development is a challenging industry to enter. While there are developers who have had great success with original games, like **Rock Star** (rockstargames.com) and **Spark Unlimited** (sparkunlimited.com), for the most part, this segment of the gaming industry is relatively mature and not likely to contain opportunities for venture investing.

Publishers still dominate the business because of the large capital requirements to market and distribute a game.

Development companies also must invest heavily in order to keep up with technological change and must have a strong brand or history of success in order to craft beneficial deals with publishers. These factors make it difficult for a new entrant into the market to find success. A trend of acquisitions by publishers has also taken many of the larger development shops out of the market as the economics for their business are deteriorating. This makes it hard to foresee a scenario that would lead a company to want to enter the market.

Infrastructure

Infrastructure is the supporting mechanisms that deliver the games and their associated services to the end user. Most infrastructure markets are mature and highly competitive. However, in the areas of online and mobile gaming, opportunities do exist in the infrastructure markets.

Retail distribution

There may be a retail opportunity, but not necessarily for a technology investor.

For traditional gaming systems and hardware – consoles and PCs, the distribution channels are mature as they are traditional retail channels of mass merchandisers and specialty stores. For example, console game systems and games are typically distributed through retail stores, both brick and mortar (**Wal-Mart, Circuit City, Toys "R' Us**) and online (**Amazon**). These are highly competitive markets, where pricing is fairly standard and margins are slim. There are also two sizeable specialty retailers in the market, notably **GameStop** and **Electronics Boutique** (EB Games). Despite the maturity of this market, an opportunity may exist for a better organized specialty retailer. This retailer would need to extend its expertise beyond traditional software and hardware into the online and mobile markets, for example, kiosks where games could be downloaded directly onto phones or handhelds. Such a retail chain, however, is not at

its core a technology company, so it would not be an attractive opportunity for a tech-based venture capital firm.

Internet connectivity

Internet connectivity is becoming a commodity business

Online games use the existing telecommunications infrastructure as their support, both for delivery and the playing of games. This market is becoming increasingly consolidated through recent mergers (**AT&T/SBC** and **Verizon/MCI**) and is highly capital intensive. Online games also use other means of internet connectivity as their backbone, including ISPs such as **Earthlink, Netscape** or **AOL** and cable companies such as **Comcast** or **Adelphia**. Regardless of connectivity type, these markets are very similar and are highly competitive. The amount of capital needed to start such a backbone company would make this market unattractive. The only area of opportunity might be in the technology services sector, away from pure connectivity. This area will be discussed in enabling technology.

Wireless providers

A Gamer MVNO is one opportunity in this sector, which is otherwise of low interest.

Mobile gaming is dependent upon the provider that a subscriber has because the provider must offer wireless data services and the games in conjunction with the capabilities of the phone the user owns. The wireless carrier market, similar to the landline telecommunications market is dominated by a small number of companies and has undergone some consolidation recently (**Cingular /AT&T**). This market itself is not attractive for entry due to its capital and size requirements. There may be opportunity for a game specific Mobile Virtual Network Operator (MVNO) which utilizes another carrier's network (such as **Virgin Mobile** or others that use **Boost Mobile/Nextel's** network). Given the market projections for mobile gaming, a gamer networks focused on the needs of gamers may be an attractive entry mechanism.

Game Aggregators / Portal

Historically, the aggregator model has not worked.

Game aggregators sit in the supply chain between game developers/publishers and the end resellers. The aggregator business model has been in and out of favor at various times. In the 1999-2000 timeframe, aggregators of online games were abundant (companies such as Mpath, Dwango, TEN), but none of those companies exist today. There were unable to find a sustainable business model and went out of business, losing to sites that simply aggregated the content of one publisher such as (**Sony's** The Station or the **Blizzard** /**Vivendi** run Battle.net).

In the wireless space, there are some emerging aggregators such as **Telcogames** or **Handango**, which consolidate games from a variety of

developers and publishers and offer them directly to consumers and wireless providers.   However, as exclusive content is being signed up in the mobile market, former aggregators such as **Mforma** (Mforma.com) are now simply only offering their own games on their sites, similar to the shift that had occurred with online gaming. We believe that similar to the online market, aggregators will not survive in the end.

The only true differentiator in the market would be exclusive content and that is difficult for an aggregator to provide. If they do have exclusive content, it is likely they are a publisher, in which case they would not also want to sell competing games, which is why in the end, the aggregator business model seems to fail. There is little room in the market for a "one stop shop" for all games. It seems an elegant business model, but has not found success. The key is that the aggregator must have a source of site traffic in order to be successful. Thus, if the commerce model could be married with a content model such as **GameSpot** (GameSpot.com) which is run by **CNET Networks**, a value proposition for consumers might be found. Portals such as **Yahoo!** function as aggregators and given their current amount of site traffic, we can see how their model works. It would be difficult for a new aggregator to gain such visibility and traffic.

Content is a critical complement to games for aggregators.

Since we are unable to find a successful aggregator business model, either in practice or theory, we do not find it to be an area of interest.

Underground Online / UGO Networks (Ugo.com), which has raised significant equity financing (over $80 million), is one example of a current online aggregator. They offer content as well as dedicated sites for the most popular MMOGs, as well as services for other forms of non-gaming entertainment. **Filefront** (filefront.com) and **IGN** (ign.com) are two other portal/game content sites that offer some games – content / aggregator hybrids. Filefront appears to have a relationship with UGO**.** In sum, however, we are not certain how profitable these business models may be and whether they are advertising or download driven sites.

Part II: High Interest VC Investment Sectors

We will now analyze those areas we feel present a strong opportunity for venture capital investment. We will describe each sector, several interesting companies in it and what we see as the key characteristics that would differentiate a market leader from other participants.

Video Game Software

Developers and Publishers – Wireless/Online

The roles of software developers and publishers are much the same in the wireless and online space as in the other sectors, but at this point on a smaller and emerging scale. Developers still design and sell games to publishers or aggregators, while publishers still are the gate keepers to the end product. In the wireless and online space, it is more common to see companies that are both developers and publishers. While the majority of the software space is relatively mature and established, there are still likely to be early stage investment opportunities in this area.

Both wireless and online gaming markets are extremely nascent in stage and the lack of dominant players will allow a startup to gain entry and market share. There are also limited technology standards, so the dominant market leader may be able to set a standard and profit from first mover advantage. Unlike the console and PC space, where the exclusive content has been locked up and is very costly, there has been little content development in the wireless and online space. Most of the established content is original, so it does not take a large licensing deal to create a foothold in the market, unlike the more mature hardware spaces. There is still ample opportunity for a combination publisher/developer to create original content and become a market leader, while that opportunity is more limited in the PC and console space.

Online Gaming

The online game development market is still very young and wide open. The styles that work are still being defined, and as a result, opportunities are still available. The strategy that we believe a successful online game developer will take will be to recognize that online gaming is a service, not a product. Developers need to satisfy customers not at the instant of purchase, but over and over again. This is distinctly different than developing console based games and as a result the most successful games are role-playing. Most of the popular massively multiplayer online games (MMOGs) are massively multiplayer online role playing games or (MMORPGs). These types of games are conducive to group and repetitive play as a gamer is a certain character in a game and leads that character through the game over time.

The industry is appealing because of the enormous growth potential. Specifically, the online gaming market is expected to grow from about $656 million in 2004 to over $2 billion in revenues in 2008.[16] We also believe that the online gaming space is attractive because of the value proposition that it offers consumers. Further, a gamer can play a MMOG for a relatively low entry free of between five and ten dollars, compared to

Wireless and Online segments will present opportunities

Online gaming has large growth predications, but unlike in the past, internet connectivity is now ready for the market

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[16] http://www.tomshardware.com/hardnews/20050202_173201.html

the fifty dollar cost of a console game. Gamers are more willing to take chances and try a new game at this lower price point as well, which means developers get rewarded for trying new types of games and game-play.

One challenge that will continue to face online game developers is cost. It is currently estimated that it costs over $25 million in upfront costs to launch a major online world. This is part of why the market leading creators of these games are large companies who act as both developers and publishers. This market, however, is still in its nascent growth stages and there is potential for new entrants.

We outline some of the potential opportunity in the publishing space when we discuss online platforms as those two areas overlap significantly. Here we will discuss game development or creation, which is also an area of interest. This market is subject to changing consumer tastes, just as console game development. These games are costly to create and must be highly successful to break-even, let alone turn a profit. However, given the nascent stage of online games, we feel it would be premature to dismiss it at this stage. In contrast to console games, exclusive content has not been locked up and there is still large potential for new entrants to start a new game genre and obtain many of the millions of new gamers coming to online gaming in the next few years.

MMOG developers are an opportunity

What is critical, however, for success is either capital or a deep pocketed publishing/distribution partner. Many of the smaller studios have been acquired or taken on close partnerships with publishers in order to fund game development and distribution. The two best examples of standalone MMOG game developers have taken on significant equity funding. We believe that is where the opportunity lies: investing in an established or up and coming MMOG developer so that they can develop hits independent from a publisher, with a likely exit being a larger acquisition by that publisher at a later time. Besides capital, compelling content is a must if a game is to win users. The game must represent either revolutionary game play or exciting content. Since the market is still young, most content is still widely unused and very little has been licensed. Game acceptance by users determines success, so a young development firm must have great reviews by gamers and a strong adoption cycle to prove the company's ability to make hits. Once this is proven, the company is still dependent upon future hits, but the recurring revenue of the existing game, and additional extensions make it a safer investment than the console developers. The nascent stage of the market also provides many exit opportunities in the near term.

As mentioned above, many of the market leaders today are large companies that both develop and publish online games. Below are examples of companies that are either owned by or tightly aligned with publishers or funded by equity investors.

Sierra Entertainment (sierra.com) is a unit of **Vivendi**, and is the developer of one of the most popular online games, *Half Life*. Vivendi also owns **Blizzard Entertainment** (blizzard.com), the creator of the *Warcraft* series of games. Sierra and Blizzard were icons in online game creation before being purchased by CUC International in 1996. CUC was one of the two predecessor companies to Cendant (the large travel and real estate services company). Cendant eventually sold their games division to Vivendi. Both companies have thus had deep pockets to develop their games for years, dating back to the start of online gaming.

Epic Games (epicgames.com) and **Digital Extremes** (digitalextremes.com) are the developers behind the *Unreal* series of games. **Atari – formerly Infogrames –** (atari.com) is the publishing partner. Together these companies have created an established franchise, and in addition, the Unreal game engine is one of the leading game engines (as discussed in the enabling software section). **Epic** is a private company that appears to have never taken any outside funding to date.

As another example of how smaller private development shops can reach success as MMOG developers, **Infinity Ward** (infinityward.com) and **Gray Matter Studios** (gmistudios.com) worked with **Activision**, their publishing partner to create new versions of the *Call of Duty* series of games. This example demonstrates the opportunity that exists for new market entrants, if they are able to obtain a deep pocketed successful publishing partner. Both studios were subsequently acquired by Activision, however, which demonstrates another trend – publisher/developer acquisition.

Mythic Entertainment (mythic.com) is a successful development group that managed to stay private, partially because they received a $32 million investment from TA Associates. Mythic is the creator of *Dark Age of Camelot*, a leading game which is distributed by Vivendi.

Turbine (turbine.com) is another independent developer of games, including *Asheron's Call,* as well as a *Lord of the Rings* and *Dungeons and Dragons* game under development. Turbine has a distribution agreement with **Sony Online Entertainment** as well as an $18 million investment from Highland Capital and Polaris Ventures.

There, Inc. (now Forterra Systems) (forterrainc.com) is now working on a variety of virtual reality applications for defense, e-learning and entertainment applications. However, earlier, the company was focused on entertainment and launched There.com, an online virtual reality world similar to Electronic Arts' popular *Sims* game. The company has raised over $50 million in VC funding from Jerusalem Venture Partners and Sutter Hill. The success of the *Sims* and *There* demonstrates the potential for new kinds of online games, beyond the typical MMORPG games.

Below are some emerging MMOG developers who have recently launched their first games or are in the process of doing so. We have focused on European or American companies, who may provide investment opportunities. There are also many additional Asian developers. Based upon public press information, none of these companies have been funded. We believe that up and coming developers like these represent the primary opportunities for a venture capital firm in this sector, as new games and game play will grow with the large market opportunity.

Nicely Crafted Entertainment (nicelycrafted.com/corporate) is an independent British developer of MMOG games, including *Time of Defiance.*

CCP (ccpgames.com) is an Iceland based game developer that was established in 1997 and released *Eve,* its only MMOG game to date.

Cryptic Studios (crypticstudios.com) is a California based developer that worked with **NCSoft** (ncsoft.net), an Asia game publisher to distribute *City of Heroes.* This game has won a lot of gaming awards and the company appears to be growing though it is being sued by Marvel (the comic company) due to the game content.

Guild Software (guildsoftware.com), a Milwaukee-based company recently released its first MMOG, *Vendetta-Online* in November, 2004.

Iron Will Games (ironwillgames.com) released its game *Ashen Empires.* The company is located in Austin, and was founded in 2004. The company is not well capitalized as it is soliciting donations for help in supporting and maintaining *Ashen Empires.*

Investment in the overall online game sector

Figure Three shows online gaming venture capital activity in the 2000-2003 timeframe. A variety of technologies and solutions are listed, but the chart overall demonstrates the opportunity in this nascent sector. We will discuss many of these companies in the corresponding sectors, including **WildTangent**, **Butterfly** and **GameSpy** (now owned by IGN).

Figure Three – Recent Online Game Fundraising

There has been significant VC investment along all parts of the online game value chain

ONLINE GAME FUNDRAISING (PRIVATE COMPANIES)

COMPANY	AMOUNT	COUNTRY
E-Pub (Uproar)	$0.5	Hungary
Netamin	$1.9	US/Korea
There	$37.0	US
Nevrax	$11.0	France
Barrysworld	$3.0	UK
Mythic	$32.0	US
Terra ICT Sdn BHD	$16.1	Malaysia
Prizepoint	$2.8	US
Zona	$1.2	US
Artifact	$4.5	US
Wild Tangent	$51.0	US
VR-1	$13.6	US
Gamania	$10.6	Taiwan
GamesSpy Industries	$15.0	US
Unibox Korea	$7.0	Korea
Taewool	$5.0	Taiwan
iWin	$30.0	US
Gamesville	$14.0	US
Gamers.com	$11.0	US
Turbine Entertainment	$13.0	US
Butterfly.net	$9.2	US

Source: Commerzbank, 2003

Wireless

Wireless gaming is also an attractive segment for venture capital investing. Throughout this section we are using the terms wireless gaming and mobile gaming as synonyms. In general we are speaking of gamers playing games on handheld devices, particularly cellular phones. This is a

significant market with huge growth potential, currently with revenues of approximately $345 million (2004), and projections of over a billion for 2007 or 2008. This market is also unique within the gaming segment, as it is not dominated by men ages 18-24, but is, in fact, 50% women. This is the one video game market segment that has a significant female presence.

As we write this paper, there is a wave of merger and acquisition activity among startups following recent rounds of venture funding. As Figures Four and Five below indicate, following a wave of recent venture funding, companies like **MForma** (mforma.com), **Sorrent** (sorrent.com), **Airborne Entertainment** (airborne-e.com), **In-Fusio** (in-fusio.com), and **Jamdat Mobile** (jamdat.com) all have acquired smaller players. Further, as this segment continues to grow, major players like EA are likely to enter, and given EA's history, they are likely to look for acquisitions and strategic partnerships.

There has been significant investment and consolidation within mobile games

The amount of venture capital investment in this sector makes us believe that it might be best to wait until the initial wave of consolidation and market shakeout occurs before investing. It is critical to pick the market leaders, and with so many companies chasing a nascent market, there is likely to be many failures. Correspondingly, investments should be made in follow-on rounds of current leaders, rather than in new entrants, who face a significant follower disadvantage. Technology standards are also still in flux, and that may be another driver for some of an oncoming shakeout.

An initial shakeout may be coming and will help define the market leaders

One key strategic success factor for start ups in this segment will be their position relative to larger players. We believe that ultimately, the segment will be dominated by several global players and several different players per geographic region. Strategic relationships will also be extremely important with carriers in addition to other game developers, as carriers are expected to look to a limited number of partners to develop content as a key way to reach customers.

Finally, winners in this space will develop their own franchises and brands like successful players in the console space. By developing a franchise, the mobile publisher will be able to own and control the product. Building a brand will also allow publishers to differentiate themselves for consumers. Ultimately we believe that mobile gaming must be viewed as complementary to other gaming platforms, and that content owners will hold the power in the segment.

Figure Four – Recent Acquisitions in the Game Industry

Recent Acquisitions in the Game Industry

Date	Target	Acquirer
Jan. '05	MindX	Mobile Media Co. AS
Jan. '05	Downtown Wireless	Jamdat Mobile Inc.
Dec. '04	Indiagames Ltd.	Tom Online Inc.
Dec. '04	Cellus USA Inc.	Airborne Entertainment
Dec. '04	Elkware GmbH	InfoSpace Inc.
Dec. '04	Macrospace Ltd.	Sorrent Inc.
Dec. '04	IOMO Ltd.	InfoSpace Inc.
Oct. '04	Tira Wireless	Airborne Entertainment
Oct. '04	Digital-Red Mobile	Shanda Interactive
Aug. '04	Blue Beck Ltd.	MForma Group Inc.
Aug. '04	FingerTwitch Inc.	MForma Group Inc.
Aug. '04	Treasure Base	Tom Online Inc.
July '04	Atlas Mobile Inc.	InfoSpace Inc.
May '04	MobileGame Korea	MForma Group Inc.

Source: TheDeal.com and wire reports

Figure Five – Recent Venture Financing

Dialing for Dollars: The Mobile Game Industry Financings - February 2005

Date	Company/ *Headquarters*	Amount ($mill.)	Round	Lead investors
Nov. '04	Digital Bridges Ltd. *London*	$18.00	3	Apax Partners, Argo Global Capital
Aug. '04	MForma Group Inc. *Kirkland, Wash.*	19	2	Draper Fisher Jurvetson
Aug. '04	Digital Chocolate Inc. *San Mateo, Calif.*	13	2	Sutter Hill Ventures, Chengwei Ventures
Aug. '04	In-Fusio SA *Bordeaux, France*	27	6	Insight Venture Partners
July '04	Sorrent Inc. *San Mateo, Calif.*	20	3	BA Venture Partners
July '04	Airborne Entertainment Inc. *Montreal*	22	N/A	Insight Venture Partners
Jun. '04	MForma Group Inc. *Kirkland, Wash.*	44	1	General Catalyst Partners, Bessemer Venture Partners
Jan. '04	Kayak Interactive Inc. *San Mateo, Calif.*	11.8	1	VantagePoint Venture Partners
Dec. '03	Jamdat Mobile Inc. *Los Angeles*	11	4	Benchmark Capital

Source: The Deal

While we believe that this will eventually be a winning sector for venture capital investment, some signs point to the fact that the sector may not be growing quite as rapidly as some estimate. For example, data indicates that among all wireless users, only 5.8% use their handsets for gaming, and within the 18-24 age demographic, only 13.8% are playing wireless games. Figure Six below (data as of 2003) shows that online gaming is the least used feature among wireless users, and Figure Seven shows that the majority of wireless gamers play less than once a month. Successful players in this segment will have the ability to convince gamers that their content is valuable and not simply a time-waster.

Mobile game adoption is still uncertain

Figure Six – Wireless Game Downloads

Monthly Wireless Downloads by Device Type

	Pictures/Video	Music/Ringtones	Applications	Games
All Devices	17	16	3	2
Basic\Enhanced Phone	17	16	3	2
Smart Phone/PDA Phone	18	6	5	2
Laptop w/wireless Modem	16	7	3	4
Laptop w/Wi-Fi	70	49	10	2

Source: Telephia

Figure Seven – Frequency of Mobile Game Play

How Often Do Mobile Gamers Play?

More than once a day	8.90%
Once a day	5.70%
Several times a week	14.50%
Several times a month	28.70%
Once a month or less	42.20%

Source: Telephia (Q3 2003 in top 35 U.U. mobile markets)

Some interesting companies in this sector are:

Digital Chocolate (digitalchocolate.com) develops entertainment and problem solving software for mobile phones. Digital Chocolate is backed by Kleiner Perkins and Sequoia Capital, and is based in San Mateo, California.

Exit Games (exit-games.com) with offices in Germany and California, and has developed a full service solution for mobile multiplayer gaming. Exit games has had significant success in Europe and is just entering the US market. Another company working to connect mobile gamers in both competitive and collaborative play is **Kayak Interactive** (kayakinteractive.com). Kayak has offices in California and New Jersey and has been backed by Vantage Point Venture Partners.

Mforma Group (mforma.com) is a global publisher and distributor of mobile entertainment. Mforma has a worldwide presence, operating in 39 countries over four continents. Mforma has offices all over the world, and current customers include Cingular/AT&T Wireless, Nextel, and Verzion Wireless. Another global developer and publisher of wireless entertainment is **Sorrent** (sorrent.com). Sorrent has been backed by NEA, Sienna Ventures, Globespan Capital Partners, and BA Venture Partners. Created in 1998, **In-Fusio** (in-fusio.com) is the European leader in downloadable games.

Founded in 2000, **Airborne Entertainment** (airborne-e.com) seeks to be an entertainment company working in the wireless space. Airborne currently has partnerships with most major wireless carriers, and is based in Montreal.

Infrastructure

Communication/Messaging

Many online games are multiplayer, meaning there are others involved in the game at the same time. Several of the games have connectivity build into them allowing for communication among players. There are also outside services which provide messaging services to games such as **Xfire** (xfire.com). Other means of communication among gamers is likely to develop and we believe that this is an area of opportunity given its nascent stage and the increased adoption of multi-player games. There is a chance for a technology leader to emerge and offer its service to the leading online game developers or platforms, to whom purchase may be a better option than building such messaging themselves.

Messaging is an area of interest as standalone tool companies begin to emerge in the sector.

Communications within games becomes more critical as more games become multiplayer among hundreds of disparate players. The large MMOG games have communication built into them, and there has been an effort to extend the reach of this communication. For instance in Sony's Everquest II game, it is possible to order a Pizza Hut pizza while playing and have it delivered at home. However, many of the smaller games do not have such robust functionality. We believe that there is opportunity for a new entrant into the communication services sector to become the

market leader. The development of a communication tool that could be integrated with various other means of communication (IM, email, cellphone, etc) and allow players to contact each other inside and outside of the game would add value to any game. Xfire, a startup, has developed an IM-type of tool for gamers and recently announced it passed one million members. Any new competitor would face them as an incumbent with a large installed base, but we believe there is still opportunity.

Xfire is mentioned above and is one of the few visible startups in this area. The Xfire tool is currently offered for free and keeps track of which players are playing what tools and allows gamers to invite friends into a game. The company is funded by Draper Fisher Jurvetson and NEA. The tool has 1 million users currently, but given the growth of gaming, that installed base can be surpassed if a better technology develops. The company is also being sued by Yahoo! since as Yahoo! claims that Xfire's technology infringes some Yahoo! patents on work done by two Xfire employees (including the VP of engineering) while they were at Yahoo!. Yahoo!'s GameProwler product allows users to see when their friends are on Yahoo! games, but does not work across platforms.

Otoy (otoy.com) is a stealth product being developed by Jules Urbach, founder of **Groove Alliance** (3dgroove.com) – a 3D game and advergaming developer. The product seems to be an IM-linked tool to allow multiplayer gaming and communication within simple games, instead of just with MMOGs.

Ventrilo (ventrilo.com) is a VoIP program that has been used in combination with online games to enable conversation during gaming. This product and perhaps something such as an adaptation of **Skype** (skype.com) would also enable communications among gamers.

We believe that the key criteria to success for a tool in this sector is interoperability. Just as new IM tools such as **Trillian** work across the standards, if a communication tool is developed that works with not only all PC games, but console and mobile games as well and with voice and text, we believe it will be the winner. Since that is likely a tall order, we believe the critical factor is to work across platforms in text first, and then add voice, perhaps via VoIP at a later point.

Speaking of interoperability, Yahoo!'s acquisition of **Stadeon** should be mentioned as Stadeon was working on technology that allows a game to be played across PCs and mobile phones. Yahoo!'s initial interest seems to be extending its games across platforms, but messaging may be a component of the end product as well.

Enabling Technology

Enabling technology presents one of the most exciting areas of opportunity for venture capital investing in the entire video game industry. In general, enabling technology is the behind the scenes services, software, and hardware that allow the game to be played, or adds certain complimentary features to the gaming experience. We believe that enabling services, enabling software, and enabling hardware all are areas full of potential investment opportunities.

Advertising / Content Services

One of the most compelling areas within enabling services is the broadly defined video game advertising. Video game advertising can be broken into two segments, in-game product placement and in game advertising, and so called "advergaming", where the game is itself the advertisement.

Advergaming

There are a number of firms that develop advergaming products, and many started as branded website games. We believe this is an interesting sector as companies look for more ways to advertise their brands to consumers. Additionally, in the age of DVRs where traditional advertising is losing impact, advergaming provides an opportunity for marketers to allow consumers to interact with their brand and build a lasting impression. A typical advergaming experience would be as follows. As part of a campaign to promote the 50th anniversary of Disneyland, Disney is rolling out an interactive, multiplayer online game called "Virtual Magic Kingdom". Gamers will be able to play free games based on real Disney attractions, with the clear goal of getting children to ask their parents to go to Disney.[17] Many of the leading advergaming companies are former website development firms and interactive agencies that has produced Flash games for websites that evolved into full production versions.

Eprize (Eprize.net) is an interactive promotion agency headquartered in Detroit with offices in Chicago, New York, Los Angeles, and London. Eprize has administered more than 1000 promotions for clients such as Coca Cola, Visa, The Gap, and Dell. Finally, Eprize is privately held, and while not currently looking for funding, may present an interesting opportunity.

A similar company is **Red Sky Interactive** (agency.com) with an impressive list of Fortune 500 companies as clients and six offices located around the world. Founded in 1995, Omnicom Group purchased a

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[17] http://www.usatoday.com/money/media/2005-01-17-disney-advergaming_x.htm

significant minority interest in 1996. In 1999 Red Sky acquired itraffic, and then was taken private in 2001 by Seneca Investments. Finally, in 2003 Red Sky Interactive became a wholly owned subsidiary of Omnicom Corp.

YaYa Media (yaya.com) also enables leading brands to develop valuable relationships with consumers through innovative and interactive entertainment solutions. American Vantage Companies acquired YaYa in April 2003.

Another company in the space is **Skyworks** (skyworks.com), which is a private company that has never taken outside funding.

In-Game Advertising

In-game advertising reaches a key demographic

Another interesting segment of video game advertising is in-game product placement and in-game advertising. This segment is particularly interesting given that consumers are spending less time watching television and more time playing games, a medium where the consumer's eyes are always on the screen. This is also a very powerful segment, as game use is dominated by the 18-34 year old demographic, which is highly sought after by consumer product groups. The segment started out as simple in game product placement with examples like a character wearing a Puma t-shirt or the outfield wall of a baseball field having static advertisements. However, in-game advertising has evolved into a dynamic function, changing based on the game, product cycle, or even time of day. **Massive Incorporated** (massiveincorporated.com) is the dominant player in this evolving sector.

There have been several significant and recent market signals indicating that in-game advertising is becoming a major segment of the gaming industry. For example, in April 2005 the first Advertising in Games Forum will be held in New York City, with industry leaders including Massive participating. Further, media measurement giant Nielsen has partnered with both Massive and **Activision** (activision.com) as a means to defend their dominance. The partnership with Activision will allow Nielsen to take internet-like measurement of in-game ad impressions. Finally, the relative ease of entry to the market, and market growth projections further enhance the appeal of this segment. The Yankee Group estimates that while only approximately $79 million was spent in this market in 2003, marketers are expected to spend over $250 million in 2007.[18] While Massive is the first mover in this segment, we still believe that there are other interesting opportunities.

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[18] http://news.com.com/2100-1024_3-5415623.html

One concern facing in-game advertising is gamer response to advertising. For most gamers, games are an escape, a way to enter another world, see new sights, and meet interesting people. Gamers my revolt at the prospect of battling aliens on far-off worlds and have to dodge behind Sony billboards for cover.[19] Winners in this segment will be those who can provide the most flexible and up to date service and monitoring to their clients.

Massive Incorporated is the current market leader in this space. The company is based in New York and recently raised $10 million, led by NeoCarta Ventures. The company has an advertising network and states that by 2005, it will reach 3.2 million gamers in the key 18-34 year old male demographic. The company's partners include Vivendi, Ubisoft and Atari.

Another in-game advertising market participant is **inGamePartners** (ingamepartners.com). The firm has the ability to target video game players through online, console and mobile environments. InGamePartners is a relatively small company with six key executives.

There are only a few in-game marketing participants, but that is expected to grow

Games-Advertising (games-advertising.com) is a private company based in Florida focused on in video game advertising and virtual product placement opportunities.

MauiGames (mauigames.com) is a private company that develops mobile games that have an embedded technology that allows for the delivery of advertising within the game. The company is now licensing the technology to mobile game developers and publishers. This 'advergaming' solution for mobile games was developed with **Enpocket** (enpocket.com), a leading provider of wireless marketing software.

Content Services - Music

A different type of content service, one that is very new and evolving is interactive, real time music being played in video games. Currently, music in video games is somewhat static and typically irrelevant to game play. One company called **Dometechnics** (dometechnics.com) seeks to create dynamic music that reflects the mood and pace of the game, rather than have the music just be repetitive and extraneous.

Online Platforms

Online platforms present an interesting opportunity within the enabling services space. As mentioned above, the success of online games hinges

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[19] http://clickz.com/experts/ad/lead_edge/article.php/3487586

on delivery of a service, not just a game. Online platforms aid in the delivery of that service by enabling games' usage and uptime. These platforms are still being developed as is all of online gaming and so there are no clear market leaders or even defined segments. Any new company which can develop a value added service to the online gaming community is likely to find success. We examine two types of platform services: hosting services and publishing services.

Online platforms will reduce the cost and increase the speed of game development

Hosting Services

One segment of platforms focuses on servers and a "bandwidth" service. Traditionally, online video games have segmented players onto separate servers, limiting the number that could interact and creating reliability and support obstacles. In the first generation of online games, when one server is down, overloaded, or patches are being installed, game-play comes to a halt. One company that has worked to overcome this problem is **Butterfly** (butterfly.net). With Butterfly's grid technology, the server interaction is completely transparent and seamless to the user, which delivers a gaming infrastructure where servers can be added, or replaced, without interrupting game-play.[20] This is an exciting area, though grid computer overall has been an area of hype for years. IBM is working with Butterfly and has been touting the service for years, though there appears to have been modest adoption to date.

There are also many companies that offer hosting services to "clans" or groups of friends who play the games together and want to rent out server space so they always have availability of a certain game within their group. Many of these small companies are also Internet service providers and offer this as another added service. Given the fragmented nature of this business, it is unlikely to provide enough opportunity to generate the capital requirements for venture financing. These companies offer dedicated server space and run the game for the clan.

Butterfly.net (butterfly.net) has raised over $13 million total in Venture funding from Jerusalem Venture Partners and Worldview Technology Partners, among others. The company also recently (3/05) replaced its management team. This company, due to its partnership with IBM, is the leader in the Grid computing space, and server suppliers such as Sun have promoted Grid computing as well for a number of applications.

VSK Gaming Servers (vskgamingservers.com)**, GriffinRUN** (griffinrun.com)**, RxTxTech** (rxtxtech.com) and **HostingGames.net** (hostinggames.net) are just a few of the many companies that offer hosting services to clans and other gamers. As mentioned above, these are niche opportunities for companies, and while they may be potential for a roll-up

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[20] http://www-1.ibm.com/grid/announce_227.shtml

of these types of companies, a new entrant faces a very fragmented market.

Hosting services is a fragmented market

"Bandwidth" services will be needed as online gaming grows. However, what hosting will look like as gaming grows is unclear. As demands on servers grow there will be an increasing need for hosting services. Also, the demand for private servers is likely to grow over time as clans and subgroups of players proliferate. Since the technology or service delivery standard has yet to be developed, there is an opportunity for a new entrant to set a standard and market leadership position.

We see the critical success factors in this sector to be: a technology partnership with a server manufacturer, a strong customer service group for gamers and first mover advantage. We believe that once gamers move their "worlds" to a certain hosting company, unseating that company will be difficult.

Publishing Platforms

Publishing platforms will help online game developers

Another type of online platform is a publishing and distribution platform. A leading company in this segment is **WildTangent** (wildtangent.com), which offers a platform that gives developers tools to create and deploy online games (see Figure Eight below). This reduces the total cost and increases the speed of getting a game to consumers. It gives developers a framework on which to build the game and easy distribution through WildTangent's own or partner hosted websites. This type of game distribution is cheaper than traditional distribution as the game is downloaded and thus requires no packaging and manufacturing cost. Most of the games which utilize platforms were relatively simple at first, not nearly as complex as MMOGs, but that is changing. This market is still evolving and its rapid rate of technology change leaves it open to new entrants.

Figure Eight – WildTangent Development and Distribution Platform
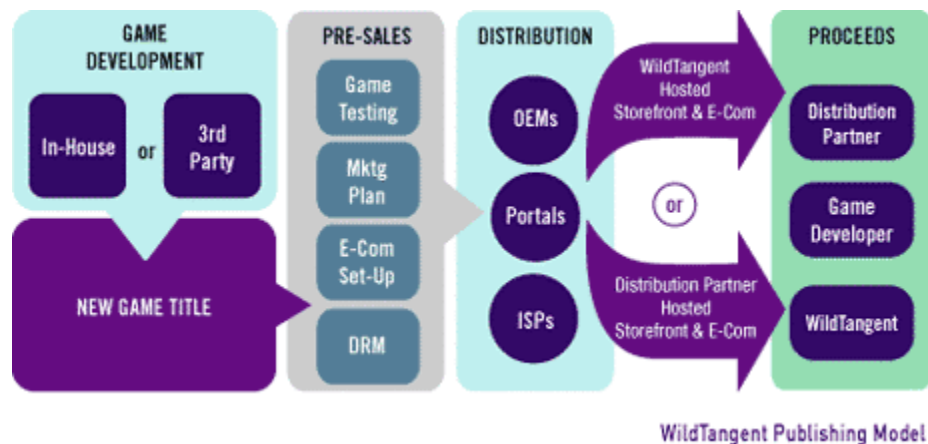
WildTangent is the leading North American online platform and publisher, but it has competition from several Asian companies as well as North American online game aggregators, whose technology fulfills the distribution portion of WildTangent's service, but not the development platform side.

WildTangent (wildtangent.com) has raised over $60 million in venture funding to build its platform and build game relationships with partners and customers including Coke, Sony and Toyota. Many of the company's games are advergaming or other marketing oriented games. Venture investors include ATV, Greylock and Madrona.

Zona, Inc (zona.net) offers what it calls a MMOG network solution to
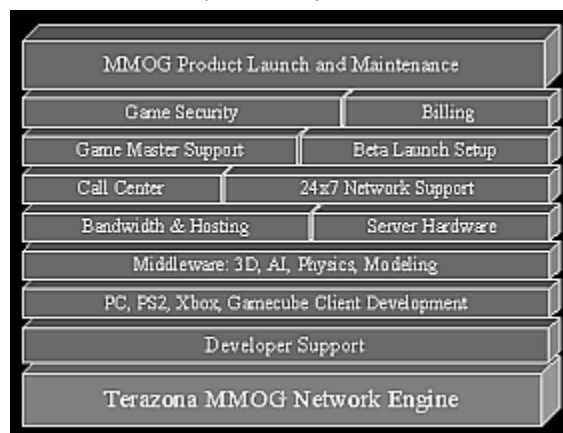
companies (seen here in Figure Nine). It is a combination of services that allow companies to deploy their game quicker and give it a more scalable and secure infrastructure. It provides much of the back-end support and infrastructure needed to launch and support a MMOG. Zona has received venture investment from InveStar Capital.

Figure Nine - Zona's MMOG network solution

Distream (Digital Interactive Stream) (distream.com) is a media-on-demand company that has developed a game on-demand platform called Game Xstream. It is a delivery platform for online gaming. The company

has raised $4 million in VC funding in January 2003 from DigaComm and Crossbow Ventures.

Asian companies are the leaders in online publishing

Webzen (webzen.co.kr) is a Korean company that is another leader in the online publishing space. Webzen is public (NASDAQ: WZEN) and has recently announced an expansion of its North American presence. It has a past record of success in Asia and recently was named the published for *All Points Bulletin*, which is an MMOG to be developed by David Jones, the creator of *Grand Theft Auto*.

NCSoft (ncsoft.net) is another Korean online publisher (it is a public company in Korea) that has gained significant market share with its *Lineage (I and II)* products which it developed as well as the *City of Heroes* game which it published for Cryptic Studios. **Level Up!** (level-up-games.com) has published Korean-developed games in India, Brazil and the Philippines. The company has also introduced payment technology into its games, a somewhat significant technology step for emerging nations.

Finally, **Funcom** (funcom.com) is a Swiss based publisher of online games that has so far only published games that is has internally developed, though it is positioned as a publisher, so it would presumably partner with other developers where appropriate.

While these companies are clearly publisher or delivery platforms, **Quazal** (quazal.com) is a Canadian company that offers a middleware technology which is part platform, part enabling technology integrator. Its Net-Z product enables faster and cheaper development of MMOG by adding network logic to a game and helping get it online.

Looking at the market, we believe WildTangent has a significant leadership position, particularly in the advergaming, marketing game and simpler games market in North America. It has not made strong inroads into the MMOG publishing or platform sector. We believe that is where ample opportunity may lie. A market leader in the platform space must have strong relationships with leading developers and unique technology if it is to succeed. The game content in the end is what creates success, and while publishers or platform makers do not take the content risk themselves, their platforms will not become widely distributed unless they have top games. If they are able to publish top games and get their platform distributed to users, they will be able to deliver numerous games to their desktop and then command profits from the developers and advertisers. WildTangent's game channel, which is embedded in millions of users' PCs, is an example of this. The market is still young, however, so WildTangent has not fully defined the standard – yet.

Currency/Product Exchange Services

A secondary market for game "goods" is a new opportunity

Another sector of enabling services is exchange or auction services for goods of value within a game, for example a weapon, a suit of armor or such. **Internet Gaming Entertainment Ltd., (IGE)** (ige.com) is one company in the space and **eBay** (eBay.com) also has auctions running for goods of this kind. While a secondary market for such items would seem to be an obvious area of commerce, there has been some controversy over IGE. Some gamer websites and boards are highly negative towards IGE and view the use of such bought merchandise as cheating. The theory goes that if it was not earned, it should not be used and is a shortcut for users. As online gaming expands to less hardcore gamers, new gamers are less likely to have such a stance against a secondary commerce market. Even today, IGE claims hundreds of thousands of users and believes the dissent is simply a very vocal minority. In any case, a company must be careful not to upset the key gamers who set opinion.

We see this area as one of opportunity given the growth in the MMORPG (massively multiplayer online role playing game) market and the lack of current exchange markets. The Themis Group predicts that the market for virtual property and services will grow from $25m in 2004 to $608m in 2008[21]. IGE has bought many of the nascent competitors in the market and is positioned as a leader. Its negative perception by gamers, however, likely gives an opportunity for an entrant who is able to win over the opinion of hardcore gamers while still providing such a commerce service – a balance which may be hard to pull off. IGE has also upset the gaming community through its ownership of a tool that is used to track player movements and gamer fears of big brother. There has been a controversy over this recent development, but it does not impact the viability of the exchange market, which we believe is a market poised for growth. An entrant simply has to enter it very carefully and politically correct, and it will find success.

Enabling Software

Enabling Software is an emerging area where capital can make a difference

Another interesting enabling technology is enabling software, which is generally third party software that enhances the gaming experience for players. Among the interesting segments of this market are 3D graphics, software development toolkits (SDKs), artificial intelligence (AI) and game engines.

There are many sectors within enabling software, as illustrated in Figure Ten, which details the various software engines and components of games. The reason that AI or behavior is highlighted in the graphic is that the

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[21] http://www.ige.com/corporate.aspx?id=press&lang=en

Figure is sourced from the website of Kynogon, an AI software developer.

Figure Ten - The Software components of games

Source: Kynogon website
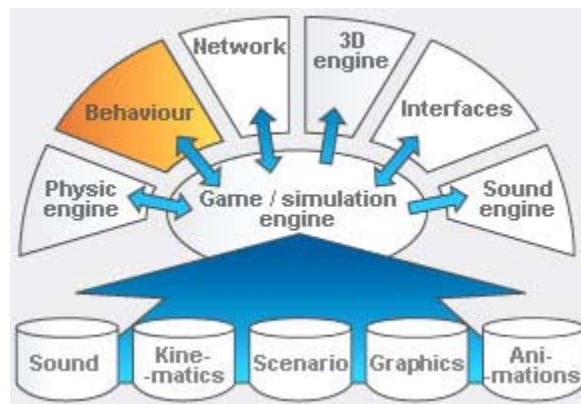
Many of these pieces may be accomplished by the same software, and we do not mean for this graphic to be illustrative of the entire industry. Rather it highlights some of the components we will discuss. We believe that any of these areas which are critical to game play and offer software tools are an area of interest.

Many of the participants in these sectors have been established for some time, but are private companies run by owner operators. The recent growth in the video game market presents them with a unique opportunity to grow the business. Prior to the last few years, the only buyers of this technology were engineering or movie graphics customers. As video games are now demanding more sophisticated graphics and tools, these firms will begin to grow as the video game market grows.

There are some proven market leaders, but the current changes in technology have created an opportunity for new entrants. All game technology has advanced, and game developers need similarly advanced toolkits. The cost of game production has also increased, so any tools able to increase the time to market will be in demand by developers.

The various markets within software tools, particularly SDKs and various engines overlap significantly. We have attempted to break out each sector, but some of the companies mentioned may have products in several of these categories. Sometimes even the same product crosses functions. We believe, however, that all of these areas are poised for growth and show investment potential. In fact, the greatest investment potential may be in creating a "one stop solution" and easing the buying process for developers today who buy several different tools and products for each part of game development.

Discreet (a division of Autodesk) (discreet.com) is the market leader in much of the 3D modeling, animation and management sector. Their product is sold to post-production firms for use in video media such as movies and television and is also sold to the video game development community. Autodesk is a public company. **Avid** (avid.com) is another large public company with products in this market. These two companies are dominant players, but due to their broad product offerings, there is potential for a game only application to win market share.

Alias (alias.com) is another leading company in the space, but like Discreet or Avid, does not likely offer an investment opportunity as it has significant investors in Accel-KKR and the Ontario Teacher's Pension, who purchased a large stake in the company in 2004.

There are, however, a number of smaller private companies in the space, such as **Newtek** (newtek.com), **PixoLogic** (zbrush.com), and **SciTech Software** (scitechsoft.com). The complexity of graphics has also created several "Best of Breed" point solutions. For example, **IDV** (idvinc.com) is a leading company in the space that focuses on software that aids the creation of trees. As other examples, **Singular Inversions** (facegen.com)**,** a private Canadian company, has developed face shaping technology, as has **Lifemode Interactive** (lifemi.com). This large number of players and market fragmentation may lead to an opportunity to combine point solutions and create a full service leading software provider. Additionally combining the 3D segment with other related parts such as Artificial Intelligence may also provide a "one stop" solution advantage.

The developer tool market is very fragmented and diverse. Opportunities are abundant and a "one stop solution" provider may be welcomed by the market.

In the SDK/developer tools segment, companies such as **Metrowerks** (metrowerks.com) (a subsidiary of Freescale semiconductor – Motorola's former semiconductor business) or **SN Systems** (snsys.com)**,** a UK based private company are leaders**. Havok** (havok.com)**,** an Irish company that produces a physics engine has a San Francisco office and has raised funding from two Irish VCs: ICC Venture Capital (part of Bank of Scotland) and Trinity Venture capital.

Artificial Intelligence is another programming area where there are a number of niche software companies. **Knogon** (knogon.com)**,** a French company, and **BioGraphic Technologies** (biographictech.com), a Canadian company, are in this space.

Knogon is one of the companies, who along with Alias, Discreet, Metroworks and SN Systems works with **RenderWare/Criterion Software** (renderware.com) on its middleware software, which attempts to integrate many of these packages. **Quazal** (quazal.com) is another company that offers similar middleware, though their product may is also a development platform. A middleware solution, which links many components or is a full solution itself, is one of the greatest opportunities in the developer software segment.

Game Engines are another market within enabling software. These are the pieces of software which are a major component of games and are in a sense a "platform" on which games are built. The engines handle functions such as the physics, lighting, and the 3D rendering. There are a small number of engines that power many leading games. This software sector, similar to the 3D and toolkit market, is dominated by companies that are private and still emerging. Thus, this area presents an opportunity

for investment as though market leaders are established, there is room for either funding them (since they are private and growing off of cash flow) or new entrants who can develop more advanced products. Leading companies in this sector, all of whom are private, are **NDL** (ndl.com), which provides the Gamebryo engine, **Epic Games** (epicgames.com), which produces the market leading Unreal Engines and **iD Software** (idsoftware.com), which has developed the Quake engines.

Whereas all of this discussion has centered on PC or console game tools, several of these segments of enabling software can be found in the value chain for mobile games. **Hybrid Graphics** (hybrid.fi) is a leader in the 3D software market for mobile games and has partnerships with many of the leading hardware and software companies, on both the mobile phone and PC gaming sectors. **FatHammer** (fathammer.com) is a Finnish company that has developed a mobile game engine (X-Forge) and development platform. The company has announced an investment of one million euros in December 2004. **Wow4M** (wow4m.com), a Korean company, and **Superscape** (superscape.com), a public British company, are two suppliers of SDKs for mobile games. This is a highly attractive segment and may be a better way to benefit from the growth in mobile gaming than investing in the game makers themselves as that market is already filled with well funded startups.

Enabling Hardware

Enabling Hardware is of interest, particularly as technology advances

Enabling hardware refers to the components within the hardware that add value to the game playing experience. Examples of this are graphics chips, sound cards and other types of processors. Both a core processor and a graphics processor are used in consoles as well as gaming focused PCs. The leading graphics chips companies are **NVIDIA** (nvidia.com) and **ATI** (ati.com), which are both large public companies. Just as in most semiconductor markets, there is opportunity for a well funded and technology focused startup to unseat these leaders. Technology changes are frequent and a group of designers from a leading chip company can handily create a new entrant by focusing their attention and efforts on creating a next generation product. Instead of competing with NVIDIA, an ATI, however, we see the most significant opportunity to be in graphics chips for mobile devices.

As mentioned above, much of the enabling hardware in this industry is semiconductor related. Graphics and sound processing chips are the backbone that increases the gaming "ability" of any game hardware. This is particularly true for PCs, where the addition of graphics or sound cards can turn a standard PC into a gamer specific PC. Graphics and sound chips are also needed for handhelds, consoles and wireless phones. We see particular opportunity in the cell phone and other mobile device category. As the functionality increases, the processors within the devices

are being asked to do more. For cell phones, this includes new functions such as image/video processing and compression. Given that trend, graphics or game processing may simply be an additional function for advanced cell phone chips. There are a number of companies in this sector and we believe the leaders who will emerge will be those that combing technology expertise with market savvy. Getting design wins in this business is difficult and takes a long sales cycle, but is equally rewarding as unseating an incumbent is a longer process. Thus, a management team which has expertise and relationships with cell phone manufacturers is critical, almost as critical as the engineering team and the technology itself.

NVIDIA and ATI both have a graphics chip for mobile phones, but given the nascent stage of the market, they have not established themselves as the leaders and will face numerous challenges. Given the small size of mobile phones, a small size chip is critical so companies that license IP and allow for the creation of multi-function SoC's may have an advantage as such an application is more space efficient than having a separate graphics chip in a phone.

The IP licensing model and SoC partners are appealing as chip size matters

Falanx (falanx.com) is Norwegian company that licenses IP cores for mobile 3D graphics processing. Its IP model means that the company does not manufacture chips, but rather licenses its technology to other chip makers and technology companies who may use it to create a complete solution or a system on a chip (SoC). The company raised $3 million in 4/04 from Selvaag Venture Capital and Alliance Venture. The company recently announced a partnership where Zoran will embed the company's IP into Zoran's mobile phone chips.

BitBoys (bitboys.com) is a Finnish company that also licenses 3D graphics cores. Bit Boys has raised money from Conventum Venture Finance and Cipio Partners, among others.

One of the leading companies in the space, **3D Labs** (3dlabs.com), who supplies everything from cores to graphics cards themselves, is a subsidiary of Creative Technology, a maker of a variety of consumer and digital products.

AlphaMosaic (alphamosaic.com)**,** which had been a leading supplier of multimedia co-processors, was acquired by Broadcom in Sept 2004. Broadcom is a leader in multimedia chips for set-top boxes and other applications. It can now be anticipated that they are likely to enter the mobile phone chip market in full force.

Atsana (atsana.com) is a Canadian fabless startup with over $31 million in financing that is also developing media processors for mobile devices, such as phones and PDAs. The company has announced its software

developer platform for device manufacturers, but has not announced shipment of product.

Nazomi (nazomi.com) is another fabless startup in this space. The company is backed by NEA and Redwood. Another VC funded company, which offers DSP solutions for multimedia applications in mobile devices is **ChipWrights** (chipwrights.com), which has been funded by BancBoston and Rock Maple Ventures, among others. Finally, **NeoMagic** (neomagic.com) is a public company (NASDAQ: NMGC) in the same sector, though it is trading at less than a dollar (as of 3/8/05).

Several Asian companies also supply chips in this market, including **Sunplus** (sunplus.com) and **Takumi** (gshark.com).

Conclusion

Our goal in this report was to perform an analysis of the video game interest in order to find areas of opportunity for venture capital investors. We have developed an framework to use as a screen and have analyzed all the major sectors of the industry.

In the end, we have found several areas that are likely to present investment opportunities:

- MMOG/Online Game Development

- Wireless Game Development and Publishing

- Communications and Messaging Tools

- Advertising and Content Services

- Online Platforms (Hosting and Publishing)

- Currency and Product Exchange Services

- Enabling Software (Developer Tools)

- Enabling Hardware (Multimedia Processors)