2004 Web and Downloadable Games White Paper

Presented at the Game Developers Conference 2004
by the IGDA Online Games SIG

The IGDA Online Games SIG Steering Committee:

Brian Robbins	White Paper Editor
Greg Mills	White Paper Assistant Editor
John Welch	Chair
Jeferson Valadares	Assistant-Chair
Alex Jarett	Chairperson Emeritus
Elonka Dunin	
Jon Estanislao	
Jennifer MacLean	
Dave Rohrl	

FORWARD

The concept of downloadable games is nothing new. Small free games have been available for download for many years. As a revenue-producing section of the industry though, Web and Downloadable games have come into their own over the past couple years. One of the places this is most apparent is at the annual Game Developers Conference, held in March in California. When our group was forming in 2000 and 2001, few people seemed to understand what web/downloadable titles were about. At GDC 2002 more people understood the market, and from the buzz you could start to see that this might become a significant portion of the game industry. At GDC 2003, Web and Downloadable games had a bit of a coming out party. There were numerous sessions devoted to the format, lots of developers creating these titles, and quite a few successful companies making the rest of the industry take notice.

As of this writing we are getting close to GDC 2004 and it is very easy to see that the Web and Downloadable games industry is transitioning from the early growth stages of the past few years, and starting to become a more mature marketplace. Several publishers and developers have found profitable and scalable business models, and have even begun leveraging their titles onto other platforms. We are seeing higher quality games, with more time and effort put towards their development.

In a similar vein, this paper is evolving from those of previous years. Instead of writing a single paper that attempts to cover the entire online games space, we broke the task into three separate papers, each targeted to a specific segment of the marketplace. The mobile gaming paper, and the Persistent World Games paper, will be available later this year.

This paper is devoted to Web and Downloadable Games. It is the result of work from more than 30 contributors, each of whom freely volunteered their time and expertise to create this document. In this paper we dive much deeper into the Web and Downloadable games industry than we were able to do in years past. We flesh out the details specific to these types of games, and as a result provide you, the developer, with a much more useful document than we could deliver before.

One would be very hard pressed to find any single document that covers in more depth and detail the state of the Web and Downloadable games industry. Our contributors have written about the overall marketplace, the various business models, and the technologies being used by developers today. They have gone beyond the catalog of publishers we have had in the past, and this year give us an overall perspective of the publishing space, as well as an in depth look at several of the key players. Finally, we have numerous case studies providing specific details and examples on a given topic.

Our contributors have done a phenomenal job this year, much better than we ever could have expected. This is truly a paper that was created for the industry, by the industry. Although this paper could not have been created without the efforts of all our volunteers, we would like to specifically thank Elonka Dunin for her tireless efforts in helping us edit and revise this paper from the work of many individuals, into the single cohesive report we now present to you. Greg Mills also deserves special mention for all of the effort he has put forth helping organize, plan, and execute on this project from the very beginning. Finally, thanks go to Radu Fusariu of Fuel Industries for creating the graphics found throughout this report.

The IGDA Online Games SIG has ongoing efforts in numerous aspects of the online games industry. All of our projects depend on the time and efforts of our volunteers. If you'd like to give something back to the community, please volunteer to get involved. You can start by visiting our website at http://www.igda.org/online/ and signing up for our discussion list.

On behalf of the contributing writers and the other members of the Steering Committee of the IGDA Online Games SIG, we thank you for your interest in our White Paper.

With best regards,

Brian Robbins
Editor, Web and Downloadable Games Paper
Senior Creative Technologist,
Fuel Industries Inc.
brobbins@fuelindustries.com

John Welch
Chair, IGDA Online Games SIG
Vice-President of Product & Technology,
AtomShockwave Corp.
john@shockwave.com

CREDITS

White Paper Editors

Editor	• **Brian Robbins** Senior Creative Technologist, Fuel Industries, Inc Email: brobbins@fuelindustries.com
Assistant Editor	• **Greg Mills** Senior Manager, Business Development, Time Warner Email: SurfMills@aol.com
Section Editors	• **Steven DeBenedictis (Online Publishers)** Principal, Bumps River Industries • **Derrick Morton (Market Overview)** Senior Director, Marketing, GameHouse Studios • **Christian Oestlien (Case Studies)** • **Andy Phelps (Technology Overview)** Assistant Professor, Rochester Institute of Technology • **Wade Tinney (Production and Design)** Large Animal • **Josh Welber (Production and Design)** Large Animal • **Mark Warner (Business Models)** CEO/President, Nexus Entertainment, LLC

Contributors by Section

Market Overview	• **David Kennerly** Contractor • **John Lee** Executive Director International Business, Turbine Entertainment • **Miguel Oliveira** CEO, GameBubbles LLC
Business Models	• **Steven Davis** CEO, IT GlobalSecure, Inc. • **Peter H Friedman** Proprietor, Certified Public Accounting firm • **Paul Lewis** Senior Vice President Sales & Marketing, MindComent Corporation • **David Nixon** Director of Publishing, Oberon Media, Inc.
Production and Design	• **Margaret Wallace** Skunk Studios • **Juan Gril** Yahoo! Games
Game Technology Overview	• **Mal Duffin** CanDo Interactive • **John-James McChesney** Senior Staff Engineer, Metrowerks • **Jehan Snyers d'Attenhoven** Cherokee Europe **Steven Davis** CEO, IT GlobalSecure, Inc.

Online Publishers	• **James L. Belcher** Consultant - FIND/SVP, Inc. • **Scylla Costa** Co-founder, Producer - Jynx Playware
Case Studies	• **Nicole Lazzaro** President, XEO Design, Inc. • **Garrett Link** Real Networks • **John Lee** Executive Director International Business, Turbine Entertainment • **Steve Meretzky** Principal Game Designer, WorldWinner • **David Nixon** Director of Publishing, Oberon Media, Inc. • **Miguel Oliveira** CEO, GameBubbles, LLC • **Simon Oliver** Head of Research and Development, Random Media • **Scott Roesch** VP Marketing, AtomShockwave Corp • **Sukhbir Sidhu** Senior Producer, PopCap • **Mike Vann** VP Sales, YaYa Media, Inc.

Biographies of all Committee Members and Contributors are located at the end of the White Paper in Section VII.

TABLE OF CONTENTS

I. INTRODUCTION

A. *Presentation at 2004 Game Developers Conference*

The findings of this paper were discussed at the 2004 Game Developers Conference (GDC) in San Jose, California, and a summary of this paper was included in the conference proceedings. This White Paper is the complete version produced by the International Game Developers Association's (IGDA's) Online Games Special Interest Group (SIG). It is available for download at no charge courtesy of the IGDA and the Online Games SIG via the IGDA website, at http://www.igda.org/online.

B. *Background and Purpose*

Web and downloadable games are one of the most exciting and fastest-growing areas of the game development industry. All game developers strive to deliver a product that is able to catch interest amidst a sea of competing products, with as few technical barriers to play as possible. However, our games are truly mass-market, and as such to be successful they must appeal to many different kinds of players, young and old, male and female.

Many of the challenges in creating successful games in this space are unique to the market. This White Paper is intended to address the needs of small to medium-sized game developers as they navigate the peculiarities of the web and downloadable market. The paper provides a snapshot of the current state of the industry and gives developers useful information and guidance for developing their businesses.

C. *Definitions*

This paper includes information on companies and technologies working with web and downloadable games.

Downloadable game: A game, typically less than 15MB, where the primary method of distribution requires download to, installation on, and execution from the end-user's hard-drive. These games are almost exclusively available by downloading from websites. In the majority of cases they will have a trial mode, with the option to purchase the full version for unlimited offline play. Examples of downloadable games can be found at almost every casual online gaming site or games channel on the major portals. This **does not** include demos of video game or PC game titles that are primarily sold through retailers. This **does** include titles that are primarily available for download, even if the game is also distributed on CD-ROM.

Web-Based game: This term describes games that are launched via a web page with **no prior installation** of software required. This does not include games that are downloaded to the user's hard-drive and run outside of the web-browser but it **does** include games launched from a web page that might require/install a general or custom ActiveX control. Common examples of this are the Flash™, Shockwave™, Java™, etc. games found on many game websites, as well as custom C++ games delivered via an ActiveX control.

D. *Audience and Scope*

The target audience for this paper is small to medium-sized web and downloadable game developers. It includes information on the companies, technologies, publishers, and ideas relating to the business of web and downloadable games.

It should be noted that there are several larger multi-player games which may fit into the category of "Web Games," such as many of the offerings from Simutronics (www.play.net). While these games technically meet our definition of web-based games, we felt that many of their qualities lead them to be more like persistent world games, which are discussed in another White Paper from this SIG. As such, these games and their specific issues are not largely discussed in this paper.

E. *Disclaimer*

This work was created and written by volunteers on behalf of the community at large. The White Paper content is based on the individual input of the contributors, and does not necessarily reflect the opinions

of the companies at which the individuals work. Everyone worked their hardest, but there may be inaccuracies and information that has become outdated since this White Paper was originally written. The information was obtained from publicly available sources, including company websites, company annual reports and SEC filings, and news sites dedicated to games. If you find your company bio is incorrect, or you feel like we missed something, we apologize! Check out the IGDA website to see how to get involved for next year and help us set the record straight! Also, this information is intended for informational purposes. If you include it in a business plan or any business process, you are responsible for its use and success or failure. Reproduction of this document in whole or part may be done without written approval but must reference this document as a source and display the following URL as the location to obtain the full report: http://www.igda.org/online/. Thank you!

II. Market Overview

A. *Introduction*

Online games continued to be a major form of entertainment in 2003. It was a year of growth, maturity and change for this nascent segment of the game industry. There was dramatic growth in the amount of content available to consumers, with the number and variety of games on the major game portals increasing significantly from last year. The biggest growth came from the increase in downloadable game offerings and skill-based gaming.

While our March 2003 Online Games White Paper identified downloadable games as an "interesting new development" there can be no doubt that these products came into their own as a major source of revenue for publishers and developers in the ensuing year. First championed on the web by sites such as Real Networks' RealArcade, Shockwave.com, Yahoo! Games, Pogo, and Microsoft's MSN Zone, other online publishers quickly followed and today the vast majority of online game publishers carry downloadable games as part of their offerings.

With this growth the segment began a new phase in its evolution. While online game sites historically have struggled with their business models, depending on the volatile advertising market for the majority of their revenue, downloadable game sales, cash competition and new subscription models emerged to bring strong additional revenue streams. The smart online publishers have trimmed their staff, focused their marketing spending and are able to finally make a profit from games.

Another part of this growth has been the emergence of technology and services leadership in the space. Transaction providers such as TryMedia™, game developers such as PopCap™ and GameHouse® and cash competition providers such as WorldWinner™ and Game Universe™ have emerged to provide services across most of the major players in the industry. The strength of these dominant players has created a nearly homogenous offering – for better or for worse.

Much of the content has evolved as well. While puzzle and card games and standards such as Mah Jong Solitaire are still the dominant genres, simulation and light action have begun to gain some traction.

With the increased opportunity came increased competition for the game developer. It is estimated that there are over 200 companies developing web and downloadable games worldwide. Major publishers report a desire to work directly with only a handful of developers while small downloadable game sites spring up almost daily and number in the hundreds. The low hanging fruit appears to have been taken and the web and downloadable game segment seems poised for merely double-digit growth for the short term and possibly significant consolidation, hallmarked by the recent acquisition of GameHouse by RealNetworks.

1. Asian Overview

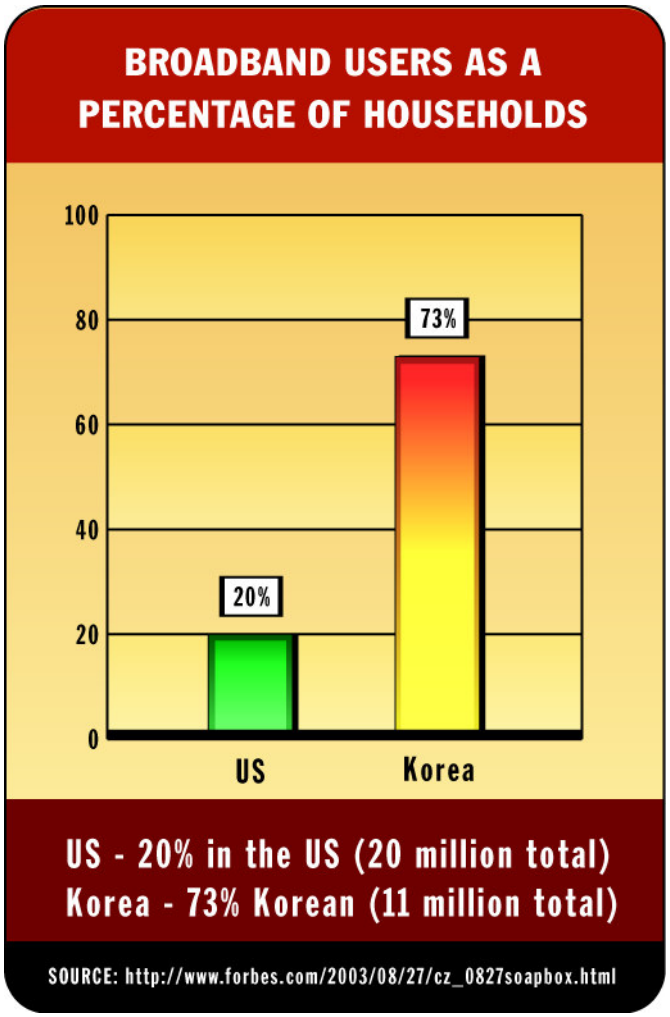
The Asia Pacific online gaming story continued to gain mass-market acceptance and momentum in 2003, particularly with massively multiplayer games (MMPs) and web-based casual games, where in both cases software piracy is a non-issue.

South Korea thus far has demonstrated the fastest growth based on proven and scalable profit models, with over a dozen major online game developers / publishers domestically producing revenues in excess of $50MM USD and net profit margins of between 30-40%. This has been driven by the highest broadband penetration rates in the world, with over 73% of households with multimegabit access[1] and PC cafes on nearly every street corner.

China in 2003 has emerged as a serious online gaming market. Driving this growth is a market of 56.6 Million Internet users as of April 2002, and expectations of reaching 80 to 90 Million by 2005.[2] China also has over 40,000 PC cafes nationwide, mirroring the South Korean Internet phenomenon in the late 1990s. Out of fourteen hours per month spent online, the average Chinese Internet user spends eight

[1] http://www.forbes.com/2003/08/27/cz_0827soapbox.html
[2] http://it.asia1.com.sg/newsarchive/04/news001_20020424.html

hours of it playing some kind of online game. This has been largely driven by what are called "2nd and 3rd tier" cities in the interior of China that lack the social, leisure or entertainment infrastructure of larger cities.



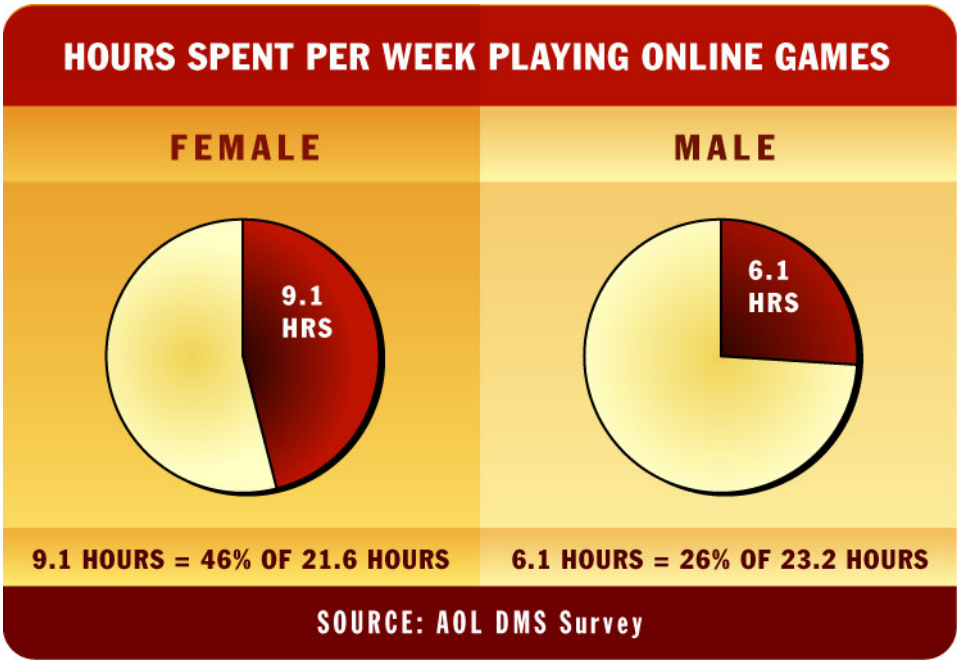
Japan follows closely as a serious contender to be the next 'big' online gaming market in Asia. Broadband penetration has hit 14MM subscribers nationwide and averages several hundred thousand new subscribers monthly.

B. *Consumer Segments*

Women over 40 continued to be the driving force of web and downloadable games in 2003. A recent AOL study found that even though men spend more time on the Internet each week than women (23.2 vs. 21.6 hours), female game-players over 40 spend the most hours per week playing online games (9.1 hours or 41 percent of their online time vs. 6.1 hours - 26 percent of their online time - for men). This demographic was also more likely to play online games every day than men or teens of either gender.[3]

When it comes to purchases of downloadable games the female skew becomes even more significant with some sites reporting as much as 70% of sales coming from females over 30.

[3] AOL DMS Survey conducted 12/4/03-1/12/04 with 3,613 casual online game players interviewed,



1. Asian Consumers

The South Korea game market is broad in reach, with a wide audience of players at all ages. China, given that it has set an age restriction for entering PC cafes, requiring consumers to be 18 years and older, is limited to more hard core gamers. Japan is a more nascent market vis a vis online gaming, but seems to be dominated more by home usage in the K-12 age groups.

C. *Market Analysis and Estimates*

IDC recently released a research paper with estimates that revenue from downloadable game sales in 2003 was over $52.7 million and will be over $760 million by 2007[4]. With the current month-to-month growth in sales at around 10% per month, this level of revenue is plausible; however, there are some signs that the growth in the downloadable and web games space has begun to slow. Now that online game consumers are more aware of the available products and have had an opportunity to make a judgment of their value, the online segment must now figure out how to sustain this burst of activity into a true game industry segment. If this can be accomplished, the $760MM mark set by IDC might be reached and surpassed before the start of 2007.

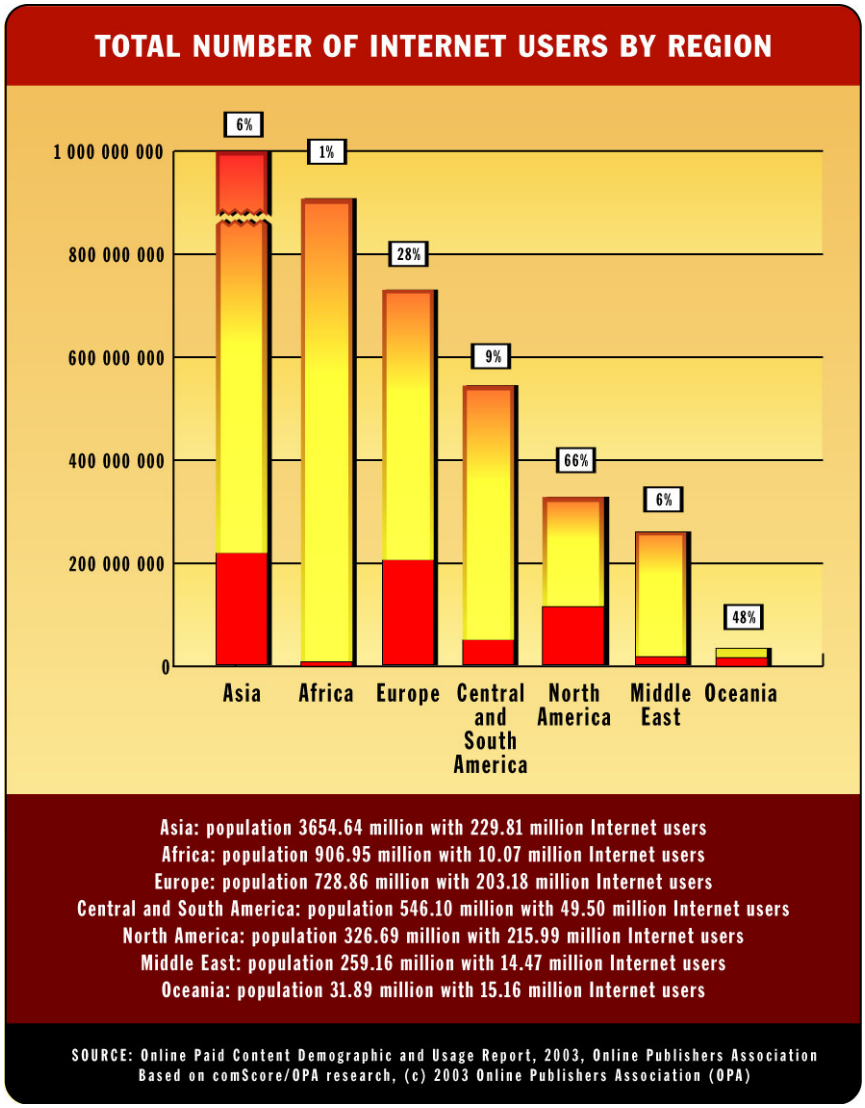
1. European Analysis

North America's population has grown to just over 320 million[5]. In comparison, Europe's population (including Russia) has reached almost 730 million[6]. Of those populations, North America has 265 million Internet users, while Europe has 203 million. However, in North America the overwhelming majority of these Internet users speak English. In Europe the top 10 markets comprise nearly 80% of the population, but only 35 million speak English as their official language.

With about 44 million Internet users, Germany remains at the top of Europe's Internet population charts. The UK follows with 35 million, and France with 22 million. When looking for potential sales opportunities, it is useful to look for the site with the most traffic. In these countries major online destinations are: Google, Yahoo!, MSN, AOL, eBay, Wanadoo, T-online, Lycos, and Tiscali. Nearly all of these are multi-national portals that also operate within the US.

[4] http://www.idc.com/getdoc.jsp?containerId=pr2003_09_16_111345
[5] http://www.internetworldstats.com/stats2.htm
[6] http://www.internetworldstats.com/stats4.htm

With the exception of Google and eBay, all of the above portals already offer game content, which makes them a great target for game developers. While in the US, the major six game portals (AOL, MSN Zone, Pogo, RealArcade, Shockwave.com, and Yahoo!), are well established and have been around for several years, the top portals in Europe are just now increasing their focus to paid game content. Most sites have previously featured web-based games, but paid downloadable content appears to be the new attraction in Europe.



2. Asian Analysis

While China and Japan have demonstrated strong adoption rates and market penetration of broadband, both markets are predicted to trail overall user consumption compared to South Korea, where online gaming dominates the amount of time spent online per user. Though the early market has been dominated by MMPs, in 2003 mass market casual gaming gained steam with item and avatar-related commerce business models, bringing to the fore several major game players in Korea such as NHN, Neowiz and Netmarble which specialize in casual gaming, focused on a wide range of ages.

China holds strong promise as an online gaming market given its strong similarities to the South Korean market – popularity of PC cafes, popularity of online gaming content and lack of penetration by console players. Microsoft and Sony both have hesitated to enter the Chinese market with their console products largely due to piracy fears, though Nintendo has announced a console entry with a China only product

based on an older generation technology. Thus without the serious threat of consoles penetrating the China market, PC platform MMP and web-based casual games consumption should grow considerably in 2004 and beyond. Already several players have taken a significant lead in the early market, with players like Shanda with leadership in both the MMP and casual game market and the three top web portals Sohu, Sina and Netease entering aggressively.

In Japan the future of online gaming is less clear as it continues to be a rich console-dominated market. A number of PC platform online game publishers emerged in 2003, including Softbank's BB Games, which launched in July 2003 with a target of offering over 100 mass market casual web games, and NTT's game service partnership with the Korean Game Development and Promotion Agency with a current pilot service of 10 casual online games.

European Development of New Revenue Sources for Internet Games

Written by Miguel Oliveira, CEO GameBubbles

For some developers publishing on their own is the most accessible way of monetizing their games. The Internet has produced several great solutions with Digital Rights Management (DRM) tools and e-commerce platforms that have made the independent game developer's life much easier. Despite significant online success, many developers still see reasons to move their games into the offline retail space. In the US, publishers such as Cosmi, eGames, and Valusoft focus on the value or budget market, which could be considered to fall into a $19.95 price category comparable to most of the games distributed online. In comparing online and brick-and-mortar game distribution we find a serious difference in the genre and complexity of the games. While puzzle, tile, and card games are being sold online for $19.95 a piece, very similar games seem to be bundled with about 10-100 other games in compilation jewel cases priced at $9.99 to $19.99.

In Europe, and in particular Germany, publishers and developers are taking a different approach to monetizing paid download content in the retail game environment. Companies like AK Tronic, dtp, and Koch Media bring paid download games to retail for about the same price as their online counterpart. One of Germany's most popular game brands, *Moorhuhn*, is famous for its free download game version, which is available as *Moorhuhn* 1, 2, 3, and Winter Edition. Despite being available for free during its promotional campaign, the bundle of those four game versions (*Moorhuhn Compilation*) sells for €5 (€1 = $1.2) online on Bild.de as well as in retail through AK Tronic.

Harry Buster, a side-scrolling shooter for casual gamers, claims to have been downloaded 100,000 times within four weeks of its online release. While the downloadable version, available through T-online.de, offers 10 levels at €4.50, the retail version published by Koch Media contains 20 levels at €9.99. Another example is *Beetle Junior*. This game is being distributed in the US for $19.99 on such portals as RealOne Arcade and Shockwave with 60 levels. In Germany, on the other hand, it offers 150 levels in the downloadable version off Bild.de for a mere €7.50. The retail box sells for €5 and provides 100 levels.

A slightly different approach is taken by BigBen and JoWood with their title *Böse Nachbarn*. Due to its file size (require approximately 130 MB free space on hard disk) this game appears to be rather appropriate for retail distribution. However, Bild.de opted to distribute a free 21MB "XS" version (3 tutorial, 2 game levels) for free, and the so-called 31MB "XL" version (6 full episodes) for €6.99 online. At the same time, the publisher Big Ben is offering a full version with 14 episodes for €14.99 through regular retail. Interestingly enough, the localized game is being distributed throughout the US retail market for $29.99. Another game that made it into the ranks of US paid download top 10 lists is "Froggy Castle". With the well accepted price tag of $19.99 it stormed into RealOne Arcade's top 10 for several weeks. The same game is being distributed in Germany through T-online.de and retail for €9.95.

Most would be surprised by such an apparently confusing European pricing strategy, in particular when contrasted with the US model. Nonetheless, there appear to be incremental revenue streams both for publishers and developers that make the retail arena a sound marketing strategy. One way for US developers to enjoy revenues from a larger number of channels and distribution platforms might be by producing multiple versions of their titles at different price points. As in many other consumer product industries, different price-sensitive market segments are addressed with a variety of product and price variations. The goal is to compensate additional investment in time and resources with increased revenues and broader market penetration that leads to a more effective revenue skimming. Certainly, this train of thought creates a lot of new questions. One of them is, whether potential distribution partners in the US are as willing to try the diversified pricing and product strategy that we see in Europe. Only time will tell.

D. *Popular Sites*

In the West, the popular web-based gaming portals have remained stable over the past year. Each of these offers portals to several independent web-based games.

Electronic Arts' Pogo.com (http://www.pogo.com) remains a huge presence as well as AOL Games whose content is provided by EA/Pogo. Pogo has recently begun to offer Pogo To Go games which are essentially downloadable games, some based on Pogo intellectual property ("IP") and the rest provided by 3rd party downloadable game developers.

Yahoo! Games (http://games.yahoo.com) offers portal and integrated community and matchmaking with the rest of Yahoo! They have also been offering downloadable games for most of 2003 although none of the games are based on their own IP.

AOL Games (Games Channel on the AOL Service) offers game content for the casual online game player and editorial and programming content for the PC/Video game player. In the casual space, AOL Games aggregates popular web and downloadable game content from third party game developers. Their content strategy is to focus on quality over quantity of games.

Shockwave.com (http://www.shockwave.com) used to focus on web-based games developed in Macromedia's Shockwave format; however, as of 2001 they pronounced themselves technology-agnostic and now offer web and downloadable games developed in Java, Flash, Shockwave, WildTangent, and C++. They also market a subscription offering consisting of exclusive online games as well as most popular downloadable titles.

RealOneArcade (http://www.realonearcade.com) provides a game manager that the user downloads. They have been one of the most aggressive providers of downloadable games – launching up to 4 new games per week.

Microsoft's The Zone provides both web-based games and online services for its published PC games (http://www.zone.msn.com). Although the pace of their downloadable game launches is slower than most sites, their significant traffic makes them a serious player in the space.

WorldWinner (www.worldwinner.com) and Game Universe (http://skill.skilljam.com) are two leading companies in the casual web skill-based gaming space. Even though they both operate their own independent sites, they rely on exclusive distribution deals with portals and online gaming sites to grow overall traffic and money players.

In Korea's web-based game sites, SayClub (http://www.sayclub.com) games are comparable to Yahoo's portal and community. SayClub is a huge community and portal that also offers customized avatars to its users. Other popular sites include HanGame (http://www.hangame.com), NetMarble (http://www.netmarble.com), and NCSoft's Gameting (http://gameting.com).

Over the past couple of years there has been a Renaissance in light downloadable games in Korea. CCR's *Fortress 2 Blue* (http://fortress2.x2game.com), an artillery game with homage to *Worms*, was one of the most popular downloadable games and is still a contender with several thousands of simultaneous players. In 2001, Nexon's *QuizQuiz* (http://www.quizquiz.com), a multiplayer quiz show and casual game

suite, created a stir. It was one of the first suite of light games to capture the both the casual gamer and the female gamer in this region. Nexon originally designed it to appeal to the girlfriends of male hardcore gamers in public game rooms. Then in 2002, Nexon's *Crazy Arcade* (http://www.crazyarcade.com) was released and during peak periods, 300,000 simultaneous players were logged into its flagship game, BnB, an eight-player descendant of *Bomberman*.

E. *Types of Games*

Web-based and downloadable games are easily grouped into genres around the most basic motivations to play.

1. Action/Arcade

Action games are fast-paced and require constant attention, coordination, and quick reflexes. They tend to require less strategic thinking than other types of genres. These games are also called arcade games since such fast-paced action games monopolize video game arcades; indeed, many are derivatives of classic arcade games. Reflexive Entertainment's *Rebound* or *Richochet Xtreme* (http://www.reflexive.net/RicochetIndex.htm), which is a Breakout-style game, was a top-selling action game in 2003. Based on player numbers at the various sites, Online Pool is arguably still one of the most popular casual free online games on the Internet.

2. Board/Card

These are also called "classic" card and board games, since they are primarily based on the famous games that have entertained people throughout the ages. Some true classics, such as Chess and Go, have had roots in player culture for centuries. Many of these card and board games are also strategy games, with definite strategies for success. Solitaire is one of the most popular types of card games on the Internet. Mah Jong tiles and Spades are both also offered by many sites.

3. Casino

The casino genre (separate from "online gambling") is a mainstay of online games. Their ease of play and widely known rules make them a great entry-level game. Popular games in the genre include Slots, BlackJack, and Video Poker.

4. Puzzle

The puzzle genre dominates web-based games; in no other medium are they so popular. These games may contain some action components, such as the real-time falling of blocks in Tetris, yet the primary characteristic is logic over dexterity.

The distinction between "puzzle" and "action puzzle" can be somewhat arbitrary, but most people consider a true puzzle game to have no element of time pressure, whereas action puzzle games force the user to think on the run. The action puzzle games seem to appeal to a wider audience, though the "pure" puzzle games can keep players on for a longer period of time.

Puzzle games are popular because they are small, quick to load/download, easy to learn, and have a steadily increasing difficulty that holds interest during repeated play. Great action puzzle games are almost trivial to learn, but as people play over and over they start to figure out that certain strategies result in much higher scores. A great example of this is GameHouse's flagship *Collapse 2*, where destroying larger groups of blocks at once leads to exponentially higher scores. Pogo's *Poppit* is another action puzzle game that launched in 2003, and one of the first major games in this market was PopCap's *Bejewelled*.

5. Word

Quiet for the past several years, the word game genre started gaining momentum in 2003 with the launch of PopCap's *Bookworm* game in May and then Atari's *Scrabble* coming onto the scene in December. It is now considered one of the most prominent genres of web-based games. Like a crossword puzzle in a newspaper, these games are rampant on the web. They take great advantage of the keyboard and mouse interface available and the fact that many computer users are more word-

literate than they are computer literate. The most successful word games only require a working vocabulary to begin playing.

6. Sports

Sports games differentiate themselves from action games with familiar gameplay and blend of strategy and action. Players can easily transfer their knowledge from the original sport to those aspects that are being adapted to the web-based game. Examples of sports games launched in 2003 include: *Nothin' But Net* (http://www.shockwave.com/sw/content/nothing_but_net) and Skunk Studios' *Gutterball 3D* (http://www.skunkstudios.com/gutterball).

7. Strategy

Games of strategy, tactical squad games, artillery games, war games, and trading games, are increasingly drawing appeal. These games face an intrinsic difficulty in that if the pace of the strategy slips into contemplation, then the user will break her spell of concentration and find something outside the game to click on. JAMDAT's *Lemonade Tycoon* brought the popular strategic simulation model to online gaming (http://www.jamdat.ca/game_lemonade_pc.php). Swirve's *Earth 2025* (http://games.swirve.com/earth) is another example in this very broadly defined category.

There are almost as many categories for games as there are actual games. Some of the most noteworthy other categories are:

8. Pet Management

This is not necessarily a true genre, distinct from strategy, in the framework of these others, yet virtual pet management has been rising in popularity over the last couple of years. Users create and raise a virtual pet, selecting various methods of nutrition, training, and care to mold the pet as desired. The overt game comes into play when pets compete against each other. The most prominent and successful example is NeoPets (http://www.neopets.com).

9. Advergame

Although more a business model than a genre, the advertisement game or "advergame" exploded in popularity during the last year. These games may contain broad and deep game play, or they may be reduced to a single scenario and test of skill or knowledge. The simpler examples might even run inside of a banner or popup ad, while fuller games are featured beside other web games on portals. Advergames seek immediate attention (to a brand) and the good ones offer instant gratification. Advergames are intended to achieve massive viral appeal or repeat play from a target audience, and the successful ones achieve both. Once the player engages, he has effectively clicked through an advertisement. Because it must load and play immediately, advergames are often developed in Flash with minimal assets. Shockwave.com reports that one of its most popular online games in 2003 was *Redline Rumble 2*, which debuted as an advergame called *ZipZaps 2: 2 Fast 2 Furious*. The game promoted RadioShack's micro RC car toys and leveraged graphic and sound assets from the *2 Fast 2 Furious* movie license.

10. Skill-Based Games or Cash Games

Skill-based games are games that have been "skillified" – a process that involves changing the rules of the game in order to eliminate elements of luck, without changing the essence of what makes the game enjoyable and alluring. Skill-based games where players can compete for cash prizes are another example of a business model rather than a genre. Companies such as WorldWinner, Game Universe, and Arkadium offer popular mainstream games – with a twist – they provide tournaments where a player can enter a tournament where the fastest, smartest, most agile player is rewarded with cash and/or prizes. The web games offered in this segment are usually mainstream card, puzzle and arcade types of games where users compete against other users for the chance to win real money. One pays an entry fee to enter a tournament and the winner collects all the entry fees paid minus a tournament management fee to the company hosting the games. The majority of these companies try to match users with similar skills to level the competition, though players often also have the option to compete with whomever they want. There are also usually free practice games at

an easy level, which players can enter in order to become familiar with the rules and interface before engaging in a cash competition.

F. *European Product Perspective*

The European download market is not as mature as the North American one. Therefore, preferences, behaviors, and motivations on the consumer side are not yet as rigidly structured. Furthermore, as a recent Nielsen/NetRatings study[7] shows, while women represent 52% of US Internet surfers, European Internet usage is primarily male surfers (58%).

G. *Asian Product Perspective*

Early casual web-based games in Asia tended to be more 2-D in nature, focusing on simple card, board, or quiz game type formats. This is very similar to current mass-market web games popular in the US and Europe today. In 2003 as Asian developers entered into full 3D game development, casual games went along with it, becoming full fledged online arcades with free gaming around space invader type shooters, fighting one-and-one, race car themes and even first person shooters such as Doom and Quake. Sites are largely free for players and wins and losses are tabulated for each user account, allowing consumers to gain additional prestige on a ladder board, or cyber cash for successful wins.

The Market for Casual Internet Games in South Korea

Written by John Lee, Turbine Entertainment

2003 was a landmark year for online gaming in South Korea. Total market size broke the $1 billion USD barrier for the first time, dominated by online gaming which took a total market share of 40%. Arcade and PC packaged product market share fell sharply, due to the continued popularity of PC cafes versus traditional coin-op arcades and rampant PC-related piracy. Depending on forecasts by different research firms and the Korean government, the wide consensus is that online gaming will continue to grow to a lion's share of the Korean gaming market, mostly at the expense of the PC packaged goods and coin-op arcade markets.

The key difference in 2003 for Korean online game players was their success regionally in exporting their content and the shift to what locals consider the 3rd generation of content, characterized by the following milestones:

First Generation: 1997 to 2000

2D isometric perspective games such as *Lineage*, *Redmoon*, and *Kingdom of the Winds*. Online gaming had yet to show its mass market promise in Korea and was restricted to hard core gamers weaned on MUD games during the mid-1990s.

Second Generation: 2001 to 2002

Partial 3D (3/4 view) perspective games such as *MU*, *Lagheim* and the advent of casual online gaming such as *Fortress, Crazy Arcade*, etc. Mass market uptake domestically began to spike, but attempts by Korean gaming companies to go global largely failed with the exception of the Taiwanese market.

Third Generation: 2003 to present

Full 3D perspective games released by over a dozen developers, with an estimated 40+ in development for release in 2004. Korean games dominate the Chinese online gaming market,

[7] http://www.nielsen-netratings.com/pr/pr_010628_au.pdf

with 80% of content (based on the % of registered users) being of Korean origin, and with Korean origin games leading in a nascent Japanese online gaming market.

2003 was important in that it validated the business model of casual mass market gaming with sustainable, quarter on quarter revenue and profit growth. Until recently, the South Korean online gaming market has focused on large scale MMPs such as *Lineage* or *MU*, but the story changed with the mega IPO of NHN (now at over $1b USD valuation) and subsequent stock price run ups of Neowiz and Netmarble, the second and third casual game portals in Korea.

In past years players such as NHN, Neowiz and Netmarble struggled to monetize large online communities, and despite past efforts to produce revenues such as advertising, advergaming / product placements and paid per usage models, it was the advent of game related avatar and item commerce that rescued their businesses.

How most sites work in Korea is that they give a kind of cyber cash to players for winning in games, which enables users to buy virtual items for themselves such as player avatars, additional power ups or item upgrades. In theory, this rewards players to play more often to gain more virtual currency and to gain greater prestige on ladders and ranking boards. In reality, most people are impatient and do not have the time or skill to continually play online and add to their virtual riches. So what casual game players engineered was the option to purchase virtual money with small one-time payments (around $5). This would allow players with otherwise lower skills or playing time to upgrade their online personas and remain competitive with those who fully upgrade their online race cars or buy an extra life for the online version of Bomberman.

The best way for an overseas audience to understand this is a coin-op arcade analogy. Imagine you and your friend are playing head to head Street Fighter at an arcade for 25 cents. For an extra 2 cents, a player can choose to upgrade his power spells or gain an additional life. If someone does it, then it's unfair to the other player (unless fully confident in his / her skills) to not follow suit and upgrade themselves to even everything out. Now multiply that across hundreds of different casual web games in Korea, from a simple car racing game to a timed quiz show where you might buy an additional hint or two. That's how Korean casual web game players are making money – they are banking on the competitive spirit and the need for consumers to gain whatever competitive edge they can. Koreans are crazy about these 'online head-to-head arcades' and perhaps in the coming years, this can grow into a global phenomenon. However, as successful as this model has been in Asia, it has not yet gained traction in the U.S.

H. *Issues and Opportunities*

There are some critical issues that web and downloadable game developers need to be aware of in their business dealings.

1. Will Subscriptions Ever Be Viable?

Online game publishers continue to make forays into the subscription business model. Pogo's new Club Pogo, Yahoo's All Star, Shockwave's GameBlast, and RealArcade's GamePass all represent varying attempts to acquire game players for the long term and extend their limited lifetime value. So far no one appears to have achieved complete success in this area.

The question that any viable subscription model needs to address is whether or not the total lifetime value of the customers being converted has a positive net present value. If only the highest spending customers are paying for the subscription plan, then it's likely that less revenue is being extracted from them than would be otherwise.

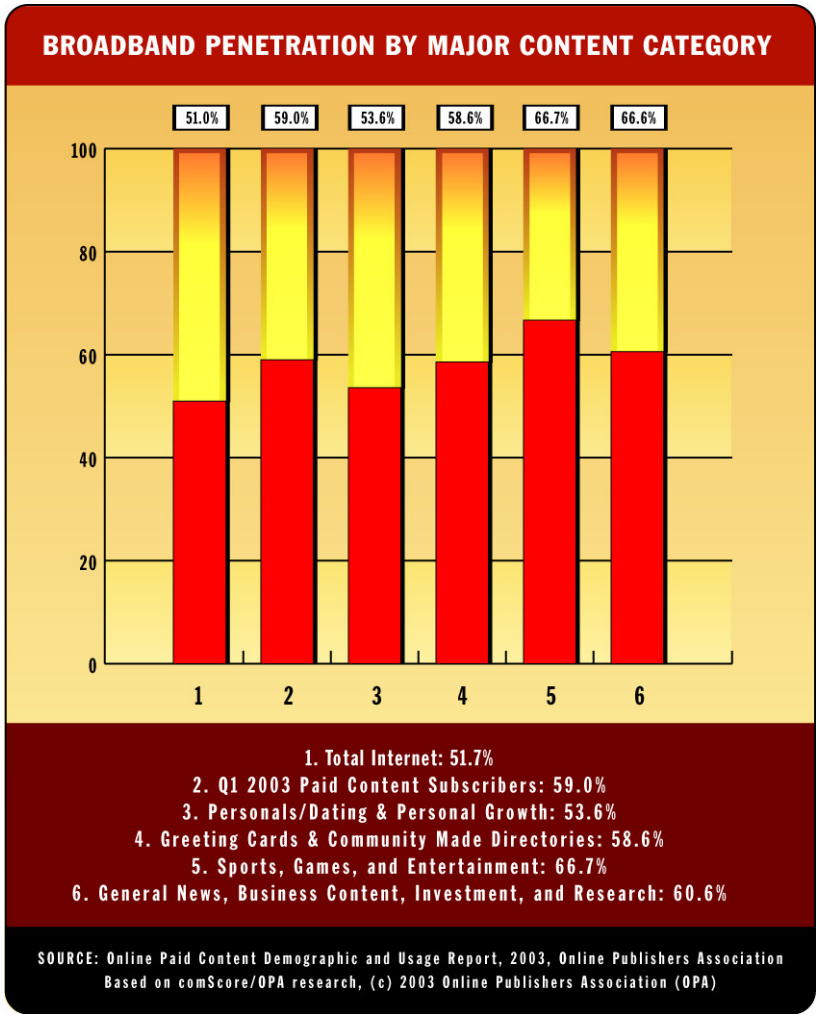
This isn't an issue when the subscription program being offered is only based on perks and additional services that have no monetary value outside the program. Yahoo!'s All Star is an example of a program that doesn't cannibalize any of the other revenue streams, but it does not appear to be lucrative based on

the number of All Star members online at any one time. Yahoo! has not shared any public numbers on subscribers to its All Star subscription service.

This is probably not a question that will be completely answered in 2004. One of the challenges the industry faces is who to look to as an example – cable, television, retail PC games, NetFlix? More likely the answer will lie in an as of yet untried business model, or hybrid between multiple models.

2. Will Broadband Kill the Downloadable Star?

There is some worry in the web and downloadable game segment that the increasing installed base of broadband will damage the viability of the segment. The theory goes that broadband customers aren't as concerned about file size and will opt for the downloadable games in the upper end of the spectrum (100 MB+) that are beginning to be offered by the major game publishers.



With over 40%[8] of US households on broadband and nearly all office PCs on fast networks, there hardly seems to be an impact at this point. If anything, broadband may be to blame for the decreasing conversion rates that some publishers have started to indicate. When downloading a new game is easy and consumers have dozens of titles to choose from, there can be less of an incentive to purchase any of them. It is unclear if broadband is the major cause, but there is a very serious concern about falling conversion rates.

[8] http://www.websiteoptimization.com/bw/0312/

One indicator that broadband is good for games is a recent study from ComScore/OPA[9] which shows that 66.7% of users purchasing content related to Sports, Games and Entertainment online have broadband – the highest of any of the categories of content surveyed.

3. Market Saturation

A year ago many small developers saw the success of games like *Bejeweled* and believed they had found an easy path to fame and fortune. Today the market is flooded with games, many of them hastily put together with very little if any originality. This has resulted in a high level of competition for available launches on major game sites. Many sites are launching at least one new game every week and sometimes two. Not only does this make for a crowded market but it also limits the amount of promotion given to each new title. If a game is not a hit in its first week, it is likely to be removed from the promotional rotation and relegated to an alphabetized list of games within its genre. Developers react by quickly putting together another game and the cycle starts again, exacerbating the problem.

For the consumer, this is a blessing and a curse. There are dozens of games to choose from but few that are worth purchasing. In addition, from a consumer's perspective there is less incentive to purchase a game when your favorite site already has more than you can possibly play for free, with additional new games coming every week. With most games allowing an hour of free play, players are guaranteed at least a few hours per week of free game play, and if they want more there are plenty of other sites to visit.

4. Will Downloadable Games Grow Up?

While in the console and PC game business it is common to align with a well-known brand, downloadable games are typically produced by very small companies and few of them are attached to major intellectual property. As the downloadable market matures, it is likely that the branding pattern will begin to emerge as a natural way for developers and publishers to break through the marketing clutter to get players to try their game. As more original yet unbranded content is produced, using recognizable intellectual property as a differentiator could become a viable strategy.

The downside to this is the further division of royalties from sales. Downloadable games are lucrative from a revenue perspective precisely because they are so much "cleaner" in their chain of royalties and commissions. A retail game has a Retailer, Distributor, Publisher, Developer and Licensor typically all vying for a piece of the game revenue. Downloadable game revenue, on the other hand, is usually just split between the transaction provider, the publisher and the developer – with the developer and the publisher usually splitting the post transaction revenue 50/50. Once a brand enters the picture, the royalty will need to be paid from somewhere. It is unlikely that the publisher will want the burden, and as a result this will usually cut into the developer's revenue.

The other part of this question is at what point will the larger game producers such as Activision, and THQ take downloadable and online games seriously enough to enter the market. All of these companies have the brands and resources to make a major play in the space. Some of them today are selling their PC box games direct to the consumer via a download. Similar to the casual online gaming space, the player has to download the entire game and then receives a free trial period. After the trial period is over, players are persuaded to purchase the game. The two main differences between the PC box games and the web and downloadable games are that the PC box games range in size from 50-650MB and usually do not have a free online web version. Thus this offering is limited to only broadband users.

5. Will casual skill-based gaming move from a niche audience to mainstream?

Over the last few years, every major portal and online gaming site has added skill-based gaming tournaments. By offering skill-based game tournaments on their site, portals and gaming sites are able to offer their user base a desired platform in which to compete, while at the same time generating incremental revenue. The question outstanding is how many casual web users will pay to compete against other casual web users in games of skill.

Security remains the primary concern of most online consumers. It is because of this concern that not all online game players are willing to participate in skill-based gaming tournaments. Concerned about

[9] http://www.online-publishers.org/opa_paid_content_demo_09192003.pdf

Internet fraud and game hackers, some players are reluctant to play skill-based games for real money. Many skill-based gaming tournament providers are trying to address this concern by encrypting connections for all passwords and financial information, and doing their best to eliminate security flaws which some users attempt to exploit in order to hack the games to gain an unfair advantage over honest game players.

Even if security concerns are addressed, skill-based game tournament providers still have to address player concerns about competing in tournaments against other game players they do not know. Once a player has paid his or her "tournament entry fee", they are faced with the issue of finding other game players, of similar ability, with whom they can compete. Aware of this issue, skill-based gaming companies have created ranking systems that ensure that players are matched up against others with similar ability in tournaments. In addition to utilizing different software to match players of equal skill, several skill-based gaming companies leverage the communal component of their site, allowing users to choose who they compete against.

Skill-based gaming tournament providers retain a fee for hosting the tournaments. As compensation for promoting the tournaments on their site, tournament providers share a portion of the proceeds with their respective partners. Because agreements between the skill-based gaming companies and their partners are often revenue share based, partners have an incentive to promote their skill-based game tournament offerings. Depending on the traffic to the site, revenue to partners can often reach well into six figures annually. The coming year will be a good indicator of the growth potential for this gaming segment.

I. *European Issues*

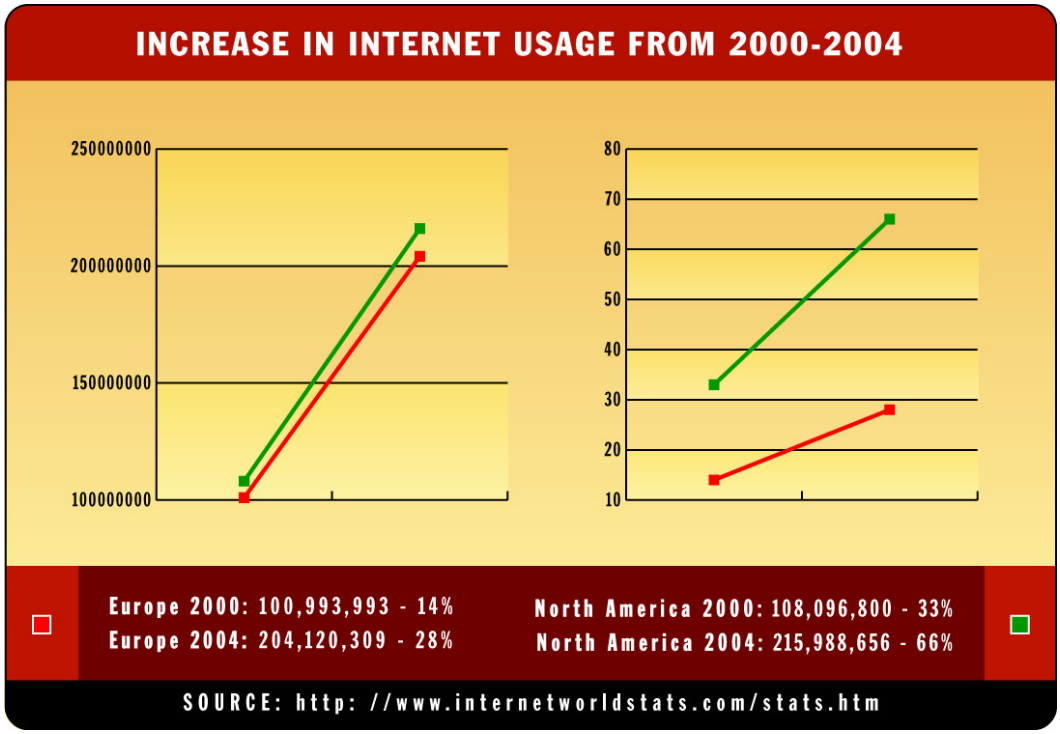
1. Online game purchase

When looking at the paid download content market, the increased number of offerings can be credited to two major factors: broadband penetration and more user-friendly payment systems. For the first factor, Europe has witnessed a major increase of Internet and broadband penetration in the last few years, to a great extent thanks to the proliferation of flat rates. From 2000 to February 2004 the number of online households in Europe nearly doubled to over 200 million, compared to the 215 million households in North America[10]. However, the European market is still not as attractive for online distributors.

For Europe, a more user-friendly payment solution, is one that addresses credit card fraud and multiple-currencies issues. Usually, US online customers simply punch their credit card information into apparently secure online e-commerce forms to buy products and services online. European online customers have been trained to be much more wary of potential fraud. This has created a market opportunity for micro and macro payment solution providers, such as Paypal and Firstgate. In a recent Forrester Research study, about 60 payment solutions were analyzed and evaluated. In some cases, faced with the options of paying either via telephone bill, SMS, or credit card, each solution attracted about 1/3 of the surveyed panel. Very specific regional user habits and bank infrastructure variables are considered by those payment solution providers in order to provide a feasible alternative to plain credit card purchase. Of significant interest is the number of people who carry credit cards. In North America nearly 80% of the population has a credit card, while in Europe less than 60% do.

In the chart below, some differences can be seen graphically. On the lefthand side, we see the growth in absolute number of internet-using households in North America (320 million households) and Europe (700 million households, including Russia). Both geographical areas had roughly 100 million internet-enabled households in 2000, and the number has grown in each area to over 200 million today. However, on the righthand side of the chart, we see these numbers compared as a percentage of total population. The lower line represents Europe. In 2000, 14% of European households had internet connectivity, and that percentage has grown to 33% today. The North American line however shows that internet connectivity has grown from 33% of North American households in 2000, to 66% today: a much higher penetration rate.

[10] http://www.internetworldstats.com/stats.htm



2. Selling games online

Knowing that there is a potential market and understanding its challenges, developers will take the next step, which is to assess which products to push. Until recently some portals would have paid advances for exclusive games, online or downloadable. But now, paradigms have been shifting left and right. Market penetration and customer acquisition used to be king in the late 90s. Then came the wave of community building and value-added content. As the dot-com bubble exploded, portals started to refocus on paid content and services. Game developers are perhaps the best suited to take advantage of this new focus. Premium downloadable games are another revenue source for web portals eager to monetize their traffic.

J. *Asian Issues*

2004 and beyond promises to be very exciting for online gaming in Asia, particularly for MMP and casual mass market gaming. With the low penetration of consoles in Asian markets (with the exception of Japan), PC platform gaming will continue to grow relatively unhindered, unless hardware owners such as Sony and Microsoft incorporate more network-oriented game services in their next generation console platforms. Even then, gaming in Asia, excluding Japan, is heavily oriented around the PC platform and will be difficult for consoles to penetrate without dealing with the already rampant piracy of each of the markets.

Unfortunately, at the expense of the growth of MMP and online casual gaming growth, PC-CD consumption will likely slide, as regional software piracy problems continue and users begin to devote more time to online gaming.

In the opinion of this author, the industry should expect to see most global game players viewing northeastern Asia as a key strategic market for online gaming, particularly for South Korea as a core consumption market, and Japan and China as potentially larger mass consumer markets with Internet and broadband penetration expanding rapidly. In particular the Korean market will be an important benchmark market with higher consumption and faster product innovation. Currently, Korean-originated game content dominates the online distribution markets of Japan and China, which is likely to be a trend for several years to come until local online game developers emerge and mature in China and Japan.

III. Business Models

Although they have been gaining increased attention these days, neither web nor downloadable games are fundamentally new concepts in the game development world. Downloadable games are the older of the two models as they came into existence in the earliest days of connected PC's in the early- and mid-80's, along with the file sharing capabilities of the BBS systems and other early Internet technologies. The younger sibling of Downloadable games, Web Games, sprang into existence 10 years later as companies such as Macromedia, Sun, and Microsoft provided technologies that could "plug in" to the popular Internet browsers and provide greatly enhanced rich-media capabilities. This section primarily outlines the current business models associated with these products. Additionally, an attempt is made to compare and contrast these different models to provide a framework for decision making related to pursuing and executing these models.

A. *Business Overview*

There seems to be a tendency in the industry to combine "Web and Downloadable" games together whenever the discussion of "alternative marketing" or "casual games" arises, as if the two were somehow either synonymous or inseparable. The first step in understanding "Web and Downloadable" games business models is the realization that these two avenues represent two different choices, and they are each separate, distinct industries with distinct customer needs, distribution channels, success metrics, and technological parameters. The figure below contrasts the key differences in the two types of games.

1. Web Games vs. Downloadable Games – The Differences

Web Game Attributes	Downloadable Game Attributes
Optimal file size <500k	Optimal file size <10MB
Plays in a browser window	Plays as a stand-alone application
Technological choices limited	Unlimited technological choices
Hardware independent	Hardware dependent
Online only	Primarily Offline
Single and Multiplayer	Must have compelling single player
Online community can greatly help retention	Online community is minimal
Can be monetized by online advertising/sponsorships	Monetized directly through game purchase
"Open" distribution	A few big channels matter most
Very high traffic is usually key to success	Focused, highly qualified traffic critical
Compelling gameplay is primary success factor	Production value + compelling gameplay
Gameplay depth not as important but helps greatly with retention	Gameplay depth is very important
Card/casino games have strong demand	Card/Casino games have weaker demand

2. Web Games vs. Downloadable Games – The Similarities

- Use the Internet as the primary distribution vehicle
- Audiences are relatively inexperienced with video games
- Successful games have extremely broadly appealing designs and are evergreen (high replay value)
- Successful games are extremely accessible and intuitive
- Some game concepts work well in both mediums

3. Exploring the Models

If there is one thing that the proliferation of the Internet has accomplished, it is that companies doing business on the web can monetize their products or services in an overwhelming variety of methods. With all the different ways companies developing and selling Downloadable Games and/or Web Games make money, a mechanism is needed to separate the good models from the bad. In other words, which techniques represent the core business models available in the space, and which can be executed for

incremental revenue? To set a context, this paper classifies these models into "Primary Business Models" and "Secondary Business Models" and defines each as follows:

a) Primary Business Model
Those business models which currently successful companies today pursue as their core set of products or services, and that without that core business the company could not exist.

b) Secondary Business Model
Those businesses in which companies are involved, but are either dependent upon the primary business model for success, or that represent a relatively small, non-cannibalistic, and incremental source of revenue that can be obtained with minimum resource investment.

Some game developers may object to the "secondary" classification of some of these models, but it is not meant to minimize the importance of these approaches. It simply draws a line between those models that seem stable on their own, vs. those models that require augmentation to stabilize them.

Shockwave's GameBlast Subscription Service

Written by Scott Roesch, VP Marketing, AtomShockwave Corp.

GameBlast (www.gameblast.com) is a premium games service of Shockwave.com, providing subscribers with a higher-quality, more convenient playing experience. Elements of this improved game experience include:

Unlimited access to premium games with exclusive features including full-screen play, bonus levels, and extra difficulty settings

No annoying ads

New releases every month at no additional charge

Discounts on other purchases

The service initially launched in November 2002 and has grown steadily since.

The GameBlast strategy grew from our efforts marketing single game titles as digital downloads to Shockwave.com consumers. In 2001, Shockwave.com made the transition from a free online entertainment site to a tiered experience, in which paying customers had access to more content. We learned at that time that consumers will pay for the right game, packaged and presented in the right way.

We foresaw that a recurring-billing strategy would ultimately be essential: Rather than relying on user relationships with specific content titles, we could build user loyalty in a broader sense. While users might not feel strongly enough about each new title to buy it, we believed that could generate loyalty to an aggregation service that provided access to a large selection of content. This approach seemed more valuable for our purposes, and also provided greater value to the consumer.

GameBlast was initially designed to allow us to test a subscription service without cannibalizing our successful digital-download business. As a result, we defined GameBlast as an online experience. We launched with 32 game titles from a broad range of genres, and duplicated basic Shockwave.com community functionality such as high scores and content reviews.

Initial response was positive, but not overwhelming. We met our initial expectations. Certain categories of game enthusiasts were extremely pleased with GameBlast; others were not. Subscriber numbers continued to grow month over month.

Interestingly to us, GameBlast subscribers quickly established themselves as our most valuable customers in terms of total annual spend. The service had proven itself for phase 1. Despite the fact that we viewed the service as a limited test offering that we were not marketing heavily, we had enough data to support further expansion.

We are now in the early phases of what internally we call GameBlast 2.0, which is a set of 6 initiatives that reflect what we have learned from subscriber feedback and service usage data. These initiatives include:

Enhanced online community. One early example of this is our Jigsaw Challenge, a daily competition to determine who can solve our daily jigsaw fastest.

Access to downloadable content. Beginning in November 2003, we've begun granting access to hit downloadable games such as Super Collapse II, Wild Wild Words, and Lemonade Tycoon at no additional charge. (Game developers are compensated on a per-play basis, as they are with online content.)

New content types and greater content selection.

External marketing partnerships. We've partnered with AT&T to distribute prepaid GameBlast subscription cards in leading retailers including Wal-Mart. And we're also making GameBlast available via partnerships with a variety of ISPs.

Increased internal marketing support. We've seen that GameBlast subscribers are our most valuable customers, so we are making GameBlast marketing a huge part of our overall efforts.

Site/service redesign. (Coming in 2004)

The evolution is in progress right now, but we already have some very encouraging data. GameBlast's active subscriber totals have grown every month since launch and in recent months have picked up considerable speed.

We are now very confident that GameBlast is going to be a significant source of revenue for us and for our game development partners. It will be especially important in a future where product conversion rates have fallen, and e-mail marketing is less effective.

We firmly believe that there is greater value in cultivating a group of subscribers who make a buying decision once and then stay with the service out of loyalty, rather than in asking our best consumers to make a specific buying decision on every new product that is released. Enabling them to take that initial leap of faith and to get one to enter their billing information requires a major commitment on our part to provide them with an overwhelmingly valuable service.

4. A Comprehensive High Level View of Business Model Choices

After separating web games from downloadable games, and further separating primary business models from secondary business models, there are several options for developers to choose from. These options are listed below.

Web Games		**Downloadable Games**	
Primary Models	**Secondary Models**	**Primary Models**	**Secondary Models**
Work For Hire	Tech. Licensing	Work for Hire	Web games

Usage licensing	Direct Distribution	IP Licensing/Sale	Direct Distribution.
Service Solutions	Download Games	Distribution Licensing	Publishing
	IP Licensing/Sale		Technical Licensing
	Game Hosting		In-Game Ads
	Cash Competition		

B. *Breaking Down the Choices*

1. Primary Models

a) Work for hire development

This is also sometimes called "time and materials", though this actually refers to a sub-type of Work for Hire. In this model, the developer charges the publisher for costs based on staffing and overhead, and receives regular payments at the agreed upon rate as work is performed. This is where all of the content is generated and developed in house. The publisher can be the developer or it can be someone else.

There are two classifications of "works for hire" as delineated by the 1976 Copyright Act. The first are those made by employees in the normal course of work such as agreeing to do a project, and being paid a salary or by the milestone for performing the work. The second involves work by contractors. For independent contractors to create works for hire two criteria must both be met; the first criterion is that the work has to fit within one of the nine specific categories outlined in section 101 of Title 17. Prior to the passage of the Satellite Home Viewer Improvement Act, the categories were: a work specially commissioned for use (1) as a contribution to a collective work; (2) as a part of a motion picture or other audiovisual work; (3) as a translation; (4) as a supplementary work; (5) as a compilation; (6) as an instructional text; (7) as a test; (8) as answer material for a test; or (9) as an atlas. The other proviso states that there must be a written agreement signed by employer and employee stating that the work in question is a "work for hire." Basically if somebody tells you what to do and when to do it by, and you receive money, then your work product is a work for hire.

The benefits to this model can be good for a smaller studio or business. Risk is very low as payments are made regardless of the outcome of the project. Developers get paid for work performed and do not have to worry about potential losses or lack of payment if the game is not a success. Even if the project does not finish, developers will likely be paid for the milestones achieved. In some cases, developers can also receive royalties after prepays are recouped and the title is a success. On rare occasions a developer could be paid per milestone and then also receive royalty payments with limited risk to the developer!

However, in this scenario the developer often does not own the rights to the IP. Usually the publisher who funded the project owns the game and any related IP. Any glory, royalties, and sequel decisions are up to the publisher and the contract that was negotiated. In some cases the publisher would also get to own all the code and tools developed on the project for that game. Further, the publisher can cancel a project at any time, thus it is possible to be paid for the first milestone and then have the project cancelled, leaving the developer scrambling for a new project.

b) Selling or Exclusively Licensing IP

These are related ways for which a developer or publisher can trade capital for strong rights to a product and IP. Complete or nearly-complete IP can have significant value if sold outright, or exclusively licensed for a determinate amount of time by a third party. Unlike “back end” revenue, this is generally paid up front, all or in part. When this immediate capital is re-invested in new development, it becomes a foundation on which to build self-sufficiency. Since the IP is created and built on spec, creative control rests with the developer, and some of the risks related to work-for-hire (such as sudden project cancellation) are mitigated in exchange for the increased risk of self-funding the IP development. Generally speaking, selling or licensing IP rights, as opposed to simply licensing usage or distribution, grants the licensor titles, assets and resources to the original in representation of a new product with all associations still attached to it, including sequels. Strong IP, when sold or exclusively licensed, can generate a great deal of revenue in this way, but developers can give away a lot for that big check.

c) Segmented Rights Licensing

Sometimes called "Non-Exclusive IP Licensing", this includes any model in which the various and sundry rights associated with a product or IP are segmented and "sold separately" to different parties who intend to use those limited rights to capitalize on a specific opportunity. In many cases, this parting-out of rights is crucial for maximizing revenue. However, the downside is the amount of time and energy it takes to identify partners who are interested in these segmented rights and to negotiate and maintain deals with each and every one of them. As with the two models listed above, there is a tradeoff of risk and reward. In this case the upside is a much higher ability to impact and optimize the potential of the IP, but the risk is the investment that must be made in business development in order to capitalize and monitor these myriad opportunities. Those resources are then not being invested in the creation of new IP that could form the basis of future business.

In the business models matrix above, two kinds of segmented rights models are specifically listed as potential primary business models; **Usage Licensing** for web games, and **Distribution Licensing** for downloadable games. In each case, the developer carves off a certain subset of rights for the Licensor to use, and probably monetize, for a specific purpose. Most commonly these two models license the right to market and promote the game to their respective user-base because they believe their user-base will see value in that content. This might be monetary value, or simply loyalty value that results in that partner being able to charge more for advertising on their site. The key to carving up rights effectively is understanding the potential and needs of the various partners, and fitting the rights picture together so there is minimal waste as defined by rights that are assigned but not capitalized on in a way that benefits the rights-holder.

d) Service Solutions

This model works best for IP owners or licensees who have a library of content that can be assembled in such a way as to provide a "package" value that is potentially greater than the sum of the parts. For example: a suite of web games, the servers to host and support them, tools for monitoring and optimizing the system, and a template-driven page generation system; all packaged as a full service to the right customer can generate an ongoing revenue stream that is in total significantly more than the individual pieces themselves would garner

Such a package often will generate very strong partnerships that last a long time, as the licensor becomes dependent on the developer to provide these services, and as a result the package can be quite lucrative. The risk is in the additional resources expended to develop the total package as opposed to stand-alone products, and the loss of flexibility if the developer finds that things aren't going as expected. Generally this approach works better in Web Games than in Downloadable Games as in the current state of the industry, at least for a developer, most of the larger potential customers for licensing rights to Downloadable Games are already in the service business.

Building a Successful Advergaming Solution for Chrysler

Written by Mike Vann, Vice President of Sales YaYa

In 2003, YaYa was tasked with building an online solution that would drive Chrysler's product consideration among adult consumers age 35-49 (with an emphasis on adult women) by communicating the unique product attributes of Chrysler's full line of vehicles.

In order to address Chrysler's campaign goals and objectives, YaYa evaluated the various games media opportunities and solutions and focused on customized Interactive Advergames. During the strategic planning phase YaYa distilled the relevant brand and target audience information, identified and outlined targeted game-based solutions for Chrysler, and supported recommendations for proceeding with developing the highest impact and most effective game type and most valuable user experience.

The solution YaYa created was the *Chrysler Get Up and Go* game, an entertaining self-assessment test that engages consumers and stimulates them to:

Learn their unique travel personality

Match their travel personality to a Chrysler vehicle

Discover their travel compatibility with friends & family

Request Chrysler product brochures

Enter to win a Wyndham Hotel & Resorts travel sweepstakes.

In order to create an effective solution YaYa utilized a combination of internal and external development resources to develop the game. The production cycle for this customized game development project spanned a total of six months and included the following phases:

Strategic Planning

Concept Development

Functional & Technical Design

Production/Development

QA & Testing

Once the game was launched the results that came back were impressive. The average game play was 7.6 minutes, and 32% of players spent 10-20 minutes playing. There was a viral compounding rate of 22%. Viral emails sent to a friend were opened 66% of the time, far exceeding the industry average for open rates of typical acquisition emails. The product even performed better relative to traditional forms of online marketing. In total 15% of game players requested vehicle brochures vs. via the website which had a 0.7% brochure request rate. The game proved to be a success for Chrysler and validates the effectiveness of advergaming as a solution for leading marketers looking to build stronger customer relationships online.

2. Secondary Models

a) Web Games/DL Games Crossover

Due to the similarities in the audiences for each type of game, development studios with a strong capability in one tend to be able to make the migration to the other fairly painlessly. Further, for some types of games these two business models can work very well together as long as the studio is clear which is the primary focus.

The design simplicity and immediate addictiveness of a good web game design often will translate well to a downloadable game design, and licensing and/or distributing such a version will often net an interesting incremental revenue stream.

Alternatively, web game versions of downloadable games can be an invaluable tool for generating qualified incremental traffic into a demo download, or even direct-to-purchase paths for a downloadable game. A web game may be the perfect pre-merchandising tool for certain downloadable games. Since many downloadable games today have no brand awareness or recognition, the free web version plays a critical role in giving consumers quick access to get a “taste” of the game. This is especially true for narrowband users who do not have the patience to wait for a 2-8 minute download and installation process for a game with which they are not familiar. Web game versions play a lesser role in importance when one is selling branded downloadable games such as Monopoly, Scrabble, etc. However, web games optimized for this effect often lack the ongoing appeal that would drive the habitual usage necessary for success in a pure web-game play, and giving away

too much in the web game can have a detrimental effect on the downloadable version(s) distributed in the same channel.

Understanding which business is the primary focus and what metrics the developer is optimizing for, is the key to making both of these models work together. As an alternative, one under-utilized possibility for generating revenue from both Downloadable games and Web games while staying true to the each medium's design needs might be for a developer to license their game IP to another company to do the other version. This could prove to be highly successful, because while the technological difficulty of such a port is low, many developers underestimate the related subtle difficulty of supporting both markets effectively.

b) Publishing

In general "Publishing" is the process of taking a particular piece of IP and making it available for sale to the public, either directly or through a B2B relationship, while retaining ownership rights over the IP. There are 3 tiers of content publishing referred to as "1st Party", "2nd Party", and "3rd Party".

1st Party Publishing is when a game is created in-house and distributed to the public through the developer's own business development or publishing efforts.

2nd Party Publishing is when a developer licenses the concept, design, or IP from another developer and then launches it under their own label as if it was fully developed in-house.

3rd Party Publishing is when distribution rights to a particular piece of content are licensed, but the product is published under the content owner's brand.

In all three cases a good publishing business depends upon a strong established distribution network to drive revenue for all parties involved. In many cases, developers in the Downloadable and Web games businesses are already in the 1st party publishing business. However, some very established developers have had success entering into 2nd party publishing as an additional secondary business model. The 2nd party business is a natural extension for established game developers as they have both the expertise and the distribution contacts to provide significant value to an up-and-coming developer.

Often two talented companies can collaborate quite effectively to create a compelling new product, and market it under a strongly established existing brand. It is more unusual to see a company for whom the primary business is game development to have success in the 3rd party publishing business. The problems start with brand competition. Developers will naturally tend to favor their own brand. Other brands that compete for a customer's time and attention tend to detract from their brand, and in many ways "compete" for the same people and dollars. Typically a publisher who has 1st party and/or 2nd party products will likely tend to push those over the 3rd party products, and thus reduce the value the relationship offers to the 3rd party product owner. Worse, 3rd party deals usually stem from one or both parties wanting to hedge their bets a bit and avoid the more complete commitment to a 2nd party deal, resulting in terms leading to reduced economics for both sides. That a successful 3rd party business is by nature a volume business, since you can do these deals quickly and with little risk or commitment to individual products, bleeds even more economics from the licensor. The final nail is that moving into a 3rd party publishing business puts the developer in flanking competition with the very partners they rely on for distribution. The result of these combined factors is that the 3rd party business is particularly unstable and difficult to make work when pursued by companies that rely primarily on a 1st party, in-house development effort as their means of doing business.

PopCap Publishes Nuclide's Rocket Mania

Written by Sukhbir Sidhu of PopCap

The game developer Nuclide contacted PopCap and wanted to work with us to create a game project for PopCap to publish. We were already familiar with Nuclide's game, *Penguin Puzzle*, and were confident that they could produce a game with a high level of quality that would resonate with our audience. A few different game ideas were suggested by Nuclide, and we

evaluated each one and eventually settled on the proposed game then known as Tube Tricks, later renamed to *Rocket Mania* after we hit upon the fireworks theme.

The mechanic had a familiar Pipeline-like feel, in which the player manipulates different types of tube pieces to create an unbroken line, but added more complexity with multiple simultaneous pathways and powerups.. We felt that this was a novel twist on the mechanic to warrant moving forward with a proof of concept.

In deciding whether or not to pursue a title for publication, PopCap looks to see that the following criteria are met by the game:

1. Must have fun and addictive game play

2. The game mechanic should be simple enough that casual users are able to quickly understand and enjoy the game in their first session, but there also should be enough depth to warrant plenty of replay that keep all types of gamers engaged for repeat play sessions.

3. The production level of graphics, sound and music should be professional and should provide excellent visual and audio feedback to the player.

4. Ideally the installer package should be under 4 or 5 megabytes in total download size, but no more than 10MB.

Since the above criteria are important for PopCap in all games that we develop internally, they are also equally important for any title that we publish for third-parties, and this causes us be very hands-on in the development of third-party titles.

Nuclide and PopCap worked very closely together on every aspect of the production, including game design, game balance, interface design, themes design, coding framework, etc. This process included much back-and-forth communication, and the developer was very good about quickly prototyping new ideas. This was invaluable as many ideas sound interesting on paper, but usually it is not until you can actually try them hands-on before you know if they work within the context of the whole game experience.

There were a number of various themes that were suggested during the course of development, but none felt right to either of us. Eventually Nuclide and PopCap found the right theme in ancient-looking Chinese fireworks. PopCap contributed some of the art assets used in the game, and provided mockups for interface design.

PopCap and Nuclide also worked very closely together to test out and balance various game modes. PopCap suggested the Strategy mode since both Arcade and Classic were timed, and we felt that players would welcome an un-timed open-ended mode.

PopCap provided C++ and Java development frameworks to Nuclide that PopCap had previously developed to speed game development. These simplify all sorts of issues such as animation, font creation, sound decompression/playback, consistent interface elements, and a host of others. Use of this framework also speeds up the test cycle since the framework is the core of all our titles, and has been extensively tested.

Since the ultimate goal of Rocket Mania is to fire off as many fireworks as you can at one time, the visual effects are very important, but they can also be demanding on the CPU. By using the PopCap C++ framework, we were able to add hardware acceleration support. This meant that supported cards would be able to take the graphics load off the CPU, resulting in much smoother game play, even in low-end computers such as a Pentium II 350MHz which had a decent 16MB

video card. We made sure the game was playable in software-only mode, but we estimate the hardware-accelerated support benefits at least 50% of our audience.

Before the product launch, PopCap made *Rocket Mania* available to the PopCap Beta Board to further fine tune gameplay. The members of this beta program are made up of a few hundred dedicated PopCap fans of all ages and from all walks of life, but each very much a casual game enthusiast. The beta testers go through various builds of the game and provide invaluable feedback and bug reports. This is usually our first indication as to how well a game will do, and often the beta process uncovers game balance and interface issues that we had not discovered, and results in very polished and well balanced games. The beta process took a couple of months to complete, but it was well worth it.

Finally, PopCap was able to leverage its long-standing relationships with the major gaming portals to distribute and promote *Rocket Mania* across the Internet. We launched the free Java version and the 'Deluxe' downloadable version simultaneously. *Rocket Mania* was nominated by Computer Gaming World magazine for Puzzle Game of the Year 2003 (another PopCap game, Bookworm, won the award.)

The close working relationship between PopCap and Nuclide ensured that *Rocket Mania* became a top-selling game.

c) Direct Distribution

Selling direct to consumers has a number of advantages over working through a partner who distributes the product. By cutting out the middle man, developers earn very high margins on every sale, and control every aspect of the distribution, allowing them to position and merchandise their games exactly as they see fit, and they don't have to compete with any other products in the channel. Finally, direct distribution allows developers to build a close relationship with their customers.

There are also a few large hurdles: It's hard, expensive, time consuming and it is a difficult balance to maintain with other partners.

To maintain a direct distribution, developers have to think about hosting and bandwidth costs, uptime, e-commerce security, Digital Rights Management, compression, installers, protecting personal information, customer acquisition and service, scaling traffic, churn, and a whole host of other issues that would otherwise be handled by distribution partners. Do not underestimate the cost of raising awareness of one's web site and acquiring new customers. With millions of sites globally, consumers rarely "stumble" onto a web site. Successful developers need to spend on marketing and advertising to generate awareness or partner with large portals initially to raise awareness for their games with consumers and other online gaming sites and portals. Each of these issues listed above takes time, money, and dedication to address. Even more importantly, if this becomes a successful source of secondary revenue, the developer will begin to compete directly with their other distribution partners, and thus may begin to threaten their primary source of revenue.

Direct distribution can be quite valuable, especially as a source of information for testing new games, staying aware of the pulse of customers, and as a safety net for the company to help insulate them from the ups and downs of external distribution sources. However, developers who depend on external distributors should be careful not to let their own distribution jeopardize their primary revenue streams.

d) Technology Licensing

In this format, business development cycles are measured in weeks, and time-to-market can be measured in days or even hours. Product success is predicated primarily on gameplay, fun-factor, and accessibility, and rarely is it based on technological advancement. As such technological breakthroughs typically do not result in a large competitive edge. However, the time savings associated with licensing technology instead of building it from scratch can be a significant advantage for the licensor. The end result is a largely untapped market for licensing technologies to other

companies, especially those technologies related to reducing the time, cost, security problems or complexities of delivering product via the Internet.

C. *Financial Models*

Below are listed the most common business models in the marketplace today. These models are not mutually exclusive, and it is not unusual for there to be a combination of several models at once.

1. Pure Revenue Share

As the name implies, both companies share the revenues generated from the product(s). How much each party receives is dependent on the specifics of the arrangement, but generally this model provides the most flexibility and leverage for the content owner as the owner has already borne the risk of creating the product. Furthermore, this method has the least amount of risk from a publishing standpoint, as little to no upfront costs are incurred. Revenue share can include the sharing of sales to consumers, shares of ad revenue generated by customers playing a game, shares of wagers made in cash competitions, etc. Revenue shares are sometimes referred to as royalties, or back-end.

2. Royalty Advance + Revenue Share

In this case the licensor advances the developer cash up front and then withholds that amount from the royalties until the advance has been repaid. This is sometimes referred to as a recoupable prepay. In this case the licensor is reducing the developer's risk by giving the developer some amount of money up front with the intention of recouping their investment as the product sells. Generally the revenue share a developer receives in this case is lower than what they would get without the prepay as the developer's risk is lower, and the licensor's risk is correspondingly higher. As a result, for a successful title, this method will generally result in fewer profits to the developer in the long run. This can still be beneficial, as the developer may need the money to develop the title in the first place. It is not without risk however, as a title which performs poorly will result in the licensor losing money, and that may affect all future deals with the developer.

3. License Fee

This is a model in which the licensor fronts the developer a non-recoupable fee in exchange for certain rights over a certain period of time. This is far more common for web games than it is for downloadable games. The time frame might be very long or very short, and the rights offered might be very broad or very narrow, and the size of the fee is reflective in all of these things. Typically deals like this do not contain any kind of revenue share, or the revenue share is very low. This is because the licensor is taking on almost all the risk of the project by paying a fixed sum to the developer.

4. IP Sale

IP sale indicates that the developer builds their own product or Intellectual Property and sells it to a distributor or publisher, thereby relinquishing **all rights** to that IP. Note that this is the IP that is being sold, not just the game. It is the game, the source code, the sequels, derivative works, everything. While a developer might be asked to consult for a period of time to make sure that the buyer can effectively utilize this IP, that will typically be a short term arrangement. When a developer sells their Intellectual Property they should typically assume that anything even resembling that IP is off limits for future products unless they have specific written exceptions in the sale agreement. Developers who wholly sell their intellectual property eliminate both their risk, and their opportunity for long-term profits. Once the sale is complete, the developer has no stake in the success or failure of products based on that property.

5. Other considerations

With so much attention usually expended on negotiating key deal points like revenue share or advances, often dealmakers fail to recognize critical value that exists within all the other portions of the agreement. A skilled negotiator can leverage their knowledge of both parties businesses into short term and long term value for both parties. Partners who have a deep understanding of each other's needs and offerings have the best chance of structuring a deal that maximizes their return on investment, while utilizing the strengths of each partner.

CASE STUDY ***Why Security Matters***

Security is an important part of any business and, as shown by the recent theft at Valve Software and Blizzard's banning of 400,000 users, is relevant to the computer game business in general. Online games face even greater threats – they are online, real-time targets for cheaters and hackers, day in and day out. Even simple Flash and Java games that only report high scores are targets.

Even with free games, there are real costs. Just to analyze and remove the cheaters incurs costs, the necessity of paying for customer support to deal with incorrectly cancelled accounts incurs costs, and, obviously, the active involvement of cheaters can decrease the enjoyment of the non-cheaters, resulting in decreased revenue, decreased perception of quality, and negative word-of-mouth.

The question for online game developers and operators is: "How much security do I need?" Just as with any other business decision – maximize revenue at minimal cost. While some security experts resist this view, it is the only sensible option as a business decision. There are no perfect security solutions. They all have costs, and they should be held to the same standards as other facets of a game venture. Unfortunately, security solutions are not conducive to absolute analysis – while the costs may be clear, the benefits are not. Rather, security systems are more effectively assessed by relative versus absolute metrics. Comparison of security systems (or lack thereof) against a single methodology can lead to more effective assessments. For example, a digital rights management system can be compared against another in terms of gains and losses of customers, consumer complaints, etc.

Hard core cheaters are not foolish. They will spend a great deal of time and sometimes dollars (though pirates will invest substantially for a good return – they are businessmen, too) to win. Active attacks by online cheaters are not a traditional business problem. Weaknesses and failures must be considered from both a business and technical perspective. Good security designs will degrade gracefully in the face of failures, and incorporate recovery mechanisms. Online games face an easier challenge in this respect than music and film – the simple act of providing an ongoing service provides an inherent mechanism for recovery from compromise. Recovery and incident management need to be built into business processes and need to be budgeted (or even purchasing insurance, if possible).

Finally, a matter of increasing relevance to all online businesses is that of regulatory and legal compliance. In addition to tax issues, security is becoming a part of the online legal debate. Privacy, security disclosure, and other relevant laws vary substantially around the world and companies need to address them to reach their global audience.

References:

"Game's source code stolen in hacking", Robert Lemos, CNET News.com, 7 October 2003, http://zdnet.com.com/2100-1105-5087698.html

"StarCraft, Diablo II, and Warcraft III Accounts Closed", 30 September 2003 – 400,000 thousand accounts closed, http://www.battle.net/news/0309.shtml

D. *Legal and Taxation Issues*

There are a myriad of legal and taxation issues that game developers must consider. The listing below is not a complete list of all issues world wide, but it should provide developers with a clear idea of things to consider during game development and distribution.

1. Legal Issues

a) Limiting Access

In the financial projections of today's game developers, one assumes a worldwide basis for sales. Some countries and cities, however, have started to censor certain types of games. These countries/cities feel that they have a legal as well as a moral right to protect their citizens and their own revenue streams.

(1) Saudi Arabia

In March 2001 Pokemon videogames and cards were banned under an Islamic edict issued by Saudi Arabia's religious authority.

(2) Australia and Brazil

Australia and Brazil took the position that Take-Two's Grand Theft Auto was a violation of the country's inherent moral and ethical code and banned the game. Yet in 2002, neither Australia nor Brazil banned Take-Two's sequel, Grand Theft Auto: Vice City.

(3) China

In November 2002, China banned all individuals under the age of 16 from Internet cafes as a measure of restricting Internet access.

(4) Greece

In 2002, due to an ongoing political scandal, the Greek legislature passed a law banning all computer gaming (gambling as well as console, online, and even handheld gaming). Arcades were shut down across Greece, tourists were instructed not to so much as bring a Game Boy into the country, and internet café owners were arrested for such things as allowing patrons to play online chess. In late September 2002, approximately 50 people had been arrested under the ban, at which point the Greek government issued regulations clarifying that the new law is only applicable to Internet gambling. The guidelines were welcomed by the gaming community, but the situation is still not entirely resolved.

(5) Thailand

In July 2003, Thailand imposed a strict curfew on online gaming which ordered access to online game servers be blocked between 10PM and 6AM every day, with Internet cafes also facing curbs to their business hours along the same lines. On September 8, 2003 this was changed to allow individuals age 18 and over will be able to opt out of this curfew, but only if they first registered with the government.

(6) Honduras

On October 12, 2002, a blanket ban on all violent videogames and toys was issued. The ban came into effect in June 2003. Among the banned games named are *Resident Evil, ShadowMan, Street Fighter, Turok, Perfect Dark, Quake* and *Doom*.

(7) St. Louis County, MO

St Louis County passed an ordinance that made it unlawful for any person knowingly to sell, rent or make available graphically violent games to minors, or to "permit the free play of "graphically violent videogames by minors, without a parent or guardian's consent. On June 3, 2003 the United States Court of Appeals (8th Circuit) issued its opinion on *Interactive Digital Software Association v. St. Louis County*, a constitutional challenge to the local ordinance. While the District Court had upheld the ordinance, the appeals court reversed. It held that the ordinance is an impermissible prior restraint of protected speech.

(8) Washington State

The Video Violence Law was signed into law in May 2003 and was to take effect on July 27th, 2003. It would have imposed a fine up to $500 on anyone who sells or rents to anyone under 18 any game that depicts violence against police officers. On July 11th, 2003, the U.S. District Court issued a preliminary injunction which temporarily blocked enforcement of the state law.

The above types of legislation decisions can affect revenue streams in two manners: first, the loss of projected revenue from the country, and second, the potential litigation costs of trying to protect those revenue streams. It is important to note that it is not just the international community that is attempting to

regulate Games – many U.S. locales and companies are also attempting to pass ordinances regulating gaming.

b) Defense Costs

Many in the legal system are very creative in their approach of defending their clients. As the gaming industry has expanded; some attorneys have argued that, "the game made my client do it." As of this date, no court has accepted this defense. It is conceivable that this will change at some point in the future, and the consequences will either be increased product liability insurance, or the requirement by publishers as well as distributors for the developer to have such insurance. An additional contingent expense would be a legal fund to defend the company against such litigation.

On October 20, 2003 a suit was filed in US District Court against Rockstar Games, Take-Two Interactive, Sony Computer Entertainment America Inc. (for distributing it) and Wal-Mart (for selling it), by parents of a motorist who was shot and killed on June 25 while driving his car. The two teenage assailants (age 16 and 14) admitted that they had randomly shot and killed the man because they were emulating behavior in *Grand Theft Auto III*. The boys are now serving an indefinite sentence after pleading guilty to reckless homicide in juvenile court. On November 16, 2003 Rockstar and Take-Two had asked the Judge to dismiss the 246 million dollar lawsuit.[11]

c) Personal Jurisdiction by Website

In the US, there is a question as to whether or not an operator of a website located in one country/state can be subject to litigation in another country/state. For a Court to assert personal jurisdiction over a nonresident defendant, two conditions must be satisfied: the exercise of jurisdiction must be authorized under the states long-arm statute; and the exercise of jurisdiction must comport with the due process requirements of the 14th Amendment.

Had Jurisdiction - The U.S. Court of Appeals (DC circuit) issued an opinion on June 14 2002 in the case of *Gorman v. Ameritrade* which found that personal jurisdiction over an Ameritrade account could exist. However, the Court did not actually hold that jurisdiction existed because the District Court had not yet established the factual record and because it affirmed the District Court's dismissal on other grounds. The court mocked the legal arguments of counsel for the brokerage company (Ameritrade is a Nebraska-based online brokerage firm) in regards to jurisdiction. The court wrote that cyberspace "is not some mystical incantation capable of warding off the jurisdiction of courts built from bricks and mortar." Judge Merrick Garland also wrote that "Ameritrade is quite wrong in treating cyberspace as if it were a kingdom floating in the mysterious ether, immune from the jurisdiction of earthly courts."

On October 7, 2002 the U.S. Court of Appeals (9th Circuit) issued its opinion in *Healthgrades.com v. Northwest Healthcare Alliance*, another case in which jurisdiction was based upon Internet activity. The court held that the U.S. District Court had personal jurisdiction over an out-of-state defendant in a defamation case, based solely upon publication of its allegedly inflammatory statements on its internet web site, which published ratings of health-care providers.

On January 9, 2003 U.S. District Court denied Sharman Network's motion to dismiss for lack of personal jurisdiction in the Kazaa copyright infringement litigation. In that case, Sharman's free software, the Kazaa Media Desktop, had been downloaded millions of times in the forum state, and Sharman had been organized offshore largely for the purpose of attempting to avoid personal jurisdiction.

On September 2nd, 2003 the U.S. Court of Appeals (9th Circuit) issued its opinion in *Gator.com v. L.L. Bean*, holding that personal jurisdiction over an out-of-state defendant may be based upon its operation of a Web site that engages in electronic commerce.

Did not have Jurisdiction - In the U.S. Court of Appeals (4th Cir.) *Carefirst Maryland v. CPC* was a case involving whether the operation of a website by a local nonprofit group can serve as a basis for personal jurisdiction over it by an out-of-state court in a trademark infringement case. The District Court dismissed for lack of personal jurisdiction, the appellate court affirmed. The reasoning was previously cited in *ALS Scan, Inc. v. Digital Service Consultants*, (293 F.3d 707) a case where the

[11] www.gamemarketwatch.com/news/item/asp?nid=2806

court found that there was no jurisdiction over an out-of-state web site in an online copyright infringement action.

The U.S District Court (DofMd) issued an opinion on September 30, 2003 in *Electronic Broking Services Limited v. E-Business Solutions & Services, et al*. D.C. No. JFM-03-1350, a case regarding personal jurisdiction based on Internet activity. The Court concluded that the "Defendants' contacts with Maryland do not rise to the level of 'minimum contacts' necessary to constitutionally subject them to either general or specific personal jurisdiction in this court". Case was dismissed.

As of this date the Supreme Court has yet to take a case in this area.

(Australia) On December 10th, 2002, the High Court Australia issued its opinion in *Dow Jones v. Gutnick*. This was a tort action brought in Australia for an allegedly inflammatory new story published on the Internet by Dow Jones, a U.S. publisher. The court held that because of publication on the Internet the Australian courts have jurisdiction, that Australian law applies, and that the case should proceed in the trial court in the Australian state of Victoria.

d) Insurance Policy Covering Property Damage

Prudent businesses should consider taking an insurance policy to cover possible damage by their product. AOL subscribers sued AOL alleging that version 5.0 had substantial bugs, and was incompatible with their computers' other application software and operating systems, causing the computers to be damaged. In that lawsuit AOL tendered the defense of these claims to St. Paul, which denied coverage. AOL settled claims, and filed a complaint against St. Paul alleging wrongful denial of coverage. In the case of *America Online, Inc, v. St. Paul Mercury Insurance Company*, the U.S. Court of Appeals (4th Circuit) on October 15, 2003 issued a split opinion. The District Court denied AOL's claims and granted summary judgment to St. Paul on the grounds that the computer users' underlying complaint did not allege physical damage to tangible property within the meaning of the insurance policy only – software damage which was not covered by AOL's insurance policy.

Developers should review their insurance policies to make sure that if anyone alleges that their game has damaged other application software and operating systems, they are adequately covered.

e) Information or Telecommunications Carrier

Classification of what type of service provider you are can subject you to various state and federal agency regulations. On October 16, 2003 the U.S. District Court (DofMinn) issued a memorandum and order in *Vonage v. Minnesota Public Utilities Commission*, holding that Vonage is an information service provider, and that the MPUC cannot apply state laws that regulate telecommunication carriers to Vonage. The court wrote "state regulation would effectively decimate Congress's mandate that the Internet remain unfettered by regulation." The conclusion was that service providers are personal information servers, rather than telecommunication servers, which prevents state and federal government entities from applying rules that apply to telecommunications, such as those pertaining to filing of tariffs, cross subsidiaries, unbundling, wiretapping and other electronic surveillance by the FBI, law-enforcement agencies and 911.[12]

f) Patent Issues

(1) Eolas Technologies

In 1999, Eolas Technologies filed suit against Microsoft alleging that it had infringed on one of its patents when enabling Internet Explorer to use plug-ins and applets. Eolas Technology first outlined the process in a patent application in the early 1990s. The technology in question is one of the fundamental elements of web browsing. Applets and plug-ins allow web surfers to view multimedia of real-time content within the web browser rather than a separate software application. Features such as movie clips, streaming audio, and live stock quotes can be embedded into web pages and served to consumers. On August 11th 2003, a federal court in Chicago ruled that Microsoft must pay $521 million after finding that its Internet Explorer program infringed on Eolas' patent. On September 11th, 2003, a federal judge rejected Microsoft's post-trial claim that Eolas had misrepresented the facts. On Monday, October 6, 2003, Microsoft filed motions to set aside the $521 million judgment and to be granted a new trial. On October 8th,

[12] Tech Law Journal October 17, 2003

2003 Eolas Technologies filed a motion to permanently stop Microsoft from distributing its Internet Explorer browser capable of running plug-in applications and applets that the Eolas patent covers.

On October 29, 2003 the World Wide Web Consortium ("W3C") released a memorandum entitled "World Wide Web Consortium Presents US Patent Office with Evidence Invalidating Eolas Patent" and subtitled "W3C Director Tim Berners-Lee urges USPTO Director to review prior art and take action." The World Wide Web Consortium submitted written submissions to the Patent Office arguing that the Eolas patent is invalid in light of prior art, but also that the patent should be held invalid because there will be substantial economic and technical damage to the web. They argue that Microsoft and others will modify their browsers to avoid patent infringement liability, and in doing so will render many existing web pages incompatible with the "modified" browsers and hence inaccessible to web users. In their written submission they state "But that feature (i.e., displaying, or embedding, an image generated by an external program in the same window as the rest of a Web page) had already been described in the prior art publications submitted herewith and was known to the Web development community. The claims of the Eolas patent are therefore plainly obviously incorrect in view of this prior art."

On October 30 The U.S. Patent and Trademark Office issued a "Director Initiated Order for Reexamination of the Eolas patent." Reexamination is an administrative procedure which allows the Patent Office to reexamine the patent in question and determine if a patent should have ever been issued in the first place. The October 30th order stated "a substantial outcry from a widespread segment of the affected industry has essentially raised a question of patentability with respect to the Eolas patent claims. This creates an extraordinary situation for which a Director ordered reexamination is an appropriate remedy." [13] It determined "a substantial new question of patentability" affecting certain of the claims and ordered a reexamination of the entire Eolas patent.

As of this writing, the time table is as follows: the US Patent Director has three months from W3C submission to determine whether a substantial new question of patentability affecting any claim was raised by the submission. If the Director determines that a question of patentability is raised, then Eolas may file a statement on such a question, including any amendment to this patent and new claims. The Director will set how long Eolas has to respond to the question, but that response time will at a minimum be at least two months. After Eolas files a response, W3C has two months to respond.

The bottom-line is that developers may face the possibility of having to significantly rewrite their Web pages or strip them of commonly used technologies like Macromedia's Flash. Microsoft said it is well on its way to side-stepping both the patent and potential injunction with an Internet Explorer alteration it previewed on October 6, 2003, a version it expects to introduce early in 2004. The previewed alteration would change the way Internet Explorer renders pages that use ActiveX controls to launch plug-ins. Microsoft also recommended to developers some methods of invoking external applications in a way it claims would prevent the patented plug-in method.[14] Yet all this may be unnecessary if the Eolas patent is declared invalid by the US Patent Office. Until the validity of the patent is decided, this author recommends that developers should take a wait and see attitude.

(2) Acacia Media Technologies

Over the past several years, Acacia Media Technologies has acquired a series of patents it believes cover the ubiquitous system of compressing streaming media files (audio and video steaming and video on demand) over the Internet, cable TV lines, satellites and wireless services. As reported in C/Net News.com News (2/6/03), the license fee Acacia wants is three-quarters of one percent of the gross revenue.

[13] www.uspto.gov and www.w3.org/2003/10/28-906-briefing, Tech Law Journal November 13, 2003
[14] C/Net News.com 8/11/03, 8/14/03, 9/11/03, 9/19/03, 9/25/03, 10/8/03

On February 14, 2003 Acacia filed patent infringement suits against 39 companies. As of September 23, 2003, 23 of the companies sued have taken out licenses as well as 18 other companies including Radio Free Virgin, the online music division of Virgin Mega stores.

(3) Friskit

Friskit is a San Francisco-based technology licensing company focused on enabling consumers to conveniently find, personalize, and play streaming media over a network. At the heart of Friskits' innovations is the recognition that, in a world where media choices available over a network will be virtually infinite, consumers will want a media search platform that is integrated with the experience of playing media. In addition, they will want to listen to or view media on networks (such as the Internet) sequentially and continuously, using network-enabled devices like personal computers, PDAs, mobile phones, smart appliances or home entertainment systems.[15]

On June 27, 2003, Friskit, Inc filed suit in Chicago, Illinois against RealNetworks and privately-held Listen.com for patent infringement. If Friskit succeeds in obtaining a permanent injunction, RealOne and Rhapsody could be prevented from offering a number of critical features, such as the ability for consumers to incorporate streaming media in personalized play lists, or to listen to a set of songs sequentially and continuously.[16]

(4) InterTrust Technologies

InterTrust Technologies is one of several companies that provide technology to protect songs and video from being illegally copied. In April 2001 it sued Microsoft alleging that the anti-copying mechanisms in Microsoft's Windows Media Player had come too close to its patent-protected technology. From that time to July 2003 InterTrust continued to expand its lawsuit to where the alleged patent infringement covers Microsoft products ranging from the Windows operating system to the Xbox game system. In July 2003 a federal judge issued a ruling which interpreted critical definitions in InterTrust's favor.[17]

(5) Macrovision

Macrovision is one of several companies that provide technology to protect songs and video from being illegally copied. Macrovision is sparring with rival company InterTrust Technologies over patents each hold on similar digital rights management technologies-similar enough that the United States Patent and Trademark Office agreed in September 2003 to decide whether the two companies' patents actually refer to the same thing, and whether just one company should hold the rights. Macrovision claims it could inherit a large portion of InterTrust Technologies' intellectual property if it wins the rights to a single uncontested patent. Currently, InterTrust Technologies is suing Microsoft for patent infringement, contending that virtually all of Microsoft's key software, ranging from the Windows operating system to its media player, trespasses on its content protection patents. If Macrovision is correct in its claims against InterTrust Technologies, it is less likely to pursue InterTrust's claims against Microsoft.[18]

(6) E-Data

E-Data is a Long Island, NY-based company that focuses largely on licensing its patents. On October 13th, 2003, it filed a suit in Germany contending that Microsoft, internet server provider Tiscali and digital music company OD2 are collectively trespassing on its patent rights with their new music download services, recently released in several European countries. E-Data is asking that the services, variously called MSN Music Club and Tiscali Music Club, be shut down until a patent licensing deal is worked out. The patent in question was granted in 1985 and covers the transmission of information to mobile point-of-sale locations; the information is then transferred to a material object. Courts in the United States have held that this does not include saving information such as a song onto a computer's hard drive, but that the selling of the information on physical media such as a disk in an in-store kiosk could be covered. It should be noted that E-Data patent expired in the United States in January 2003.

[15] Friskit.com
[16] C/Net News.com 7/1/03
[17] C/Net News.com 7/16/03
[18] C/Net News.com 10/15/03

E-Data previously won court judgments against several companies over download services, including sheet music publisher Hal Leonard and computer games company Broderbund.[19]

(7) Sun Microsystems (Java)

On October 7, 2003 Microsoft issued a press release stating, "Recognizing the need to provide a smooth transition for current users of the Microsoft® Java Virtual Machine (MSJVM), Microsoft Corp. and Sun Microsystems Inc. today announced an agreement under which Microsoft will extend its support for the MSJVM until Sept. 30, 2004. In addition, Microsoft and Sun have agreed to include links on Microsoft's Web site that will provide upgrade information and assistance to customers and developers currently using the MSJVM"[20]

(8) Wisconsin Alumni Research Foundation

On October 20, 2003 University of Wisconsin Madison's commercial arm, Wisconsin Alumni Research Foundation (WARF), filed a patent infringement suit in the US District Court for the Western District of Wisconsin against Sony and Toshiba, claiming that the technology used in the creation of the PS2's Emotion Engine infringes on their US patent #4,630,094. The patent, issued on December 16, 1986, is titled "Use of metallic glasses for fabrication of structures with submicron dimensions" and covers products which allegedly include the Emotion Engine and other integrated circuits using copper interconnect technology that are currently being marketed by Toshiba. Sony and Toshiba had 20 days to respond to the filing.[21]

(9) Digital Millennium Copyright Act

The Digital Millennium Copyright Act prohibits the hacking of copy-protection measures on recorded movies, music and software. In the week of October 31, 2003 the US Copyright Office ruled on what works would be exempt. One of the ruled exemptions pertains to "obsolete" computer programs and video games which require the original media in order to function. The ruling defined obsolete to mean "no longer manufactured or reasonably available in the commercial marketplace."[22] (This is known in the industry as "abandonware")

g) Taxation Issues

(1) International Taxation of Web-Based Games

Web based games have stretched the legal definition of who has the right to tax the cash flow generated by those games. The definition in question is one of nexus. Prior to the Internet and mail-order, nexus was easy to establish. The physical location of the vendor was the location that could tax the transaction. Mail-order began to blur the importance of physical location. The Internet (or e-commerce) has diminished physical presence to a point where it is a minor factor in determining nexus. E-commerce utilizes servers. Web-based games also utilize servers in the same manner. A person logs onto the game server, pays a monthly subscription fee to play the game (Odd World, EverQuest, etc.), or perhaps when the user purchased the software, it enabled him or her to access based multiplayer games (Battle.net, etc.). The international Organization for Economic Cooperation and Development (OECD) on January 9, 2001 announced a change in its position in regards to servers. The OECD decided that a server could meet the definition of permanent establishment. The language adopted by the committee provides that computer servers can be considered to create a permanent establishment if "the business of an enterprise is wholly or partly carried along through the equipment." A central issue is whether the activities carried along through the server are merely preparatory or auxiliary? In which case they would not generate a permanent establishment or go beyond that threshold. Other significant points made by the additions to the treaty commentary include conclusions that:

1. A World Wide Web site does not by itself create a permanent establishment because it does not constitute a fixed place of business; a web site hosting arrangement typically does not result in permanent establishment status for an enterprise paying for space on a server it does not own; and no human intervention surrounding the server is required for a permanent establishment to

[19] C/Net News.com 10/13/03
[20] http://www.microsoft.com/presspass/press/2003/oct03/10-07MaintenanceLicensePR.asp
[21] Computerworld.dk 10/28/03
[22] Gamemarketwatch.com 10/31/2003

exist. Notwithstanding the OECD, the United Kingdom has statutorily determined that a server located in the United Kingdom will not create nexus; thereby a nonresident United Kingdom gaming company who has their servers located in the UK will not be taxed (see exception regarding VAT) in the UK. Italy has determined that if you use a smart server, you have created a physical presence in Italy and that Italy has the right to tax your income stream. The German Federal Tax Court in April 2002 took under consideration whether a computer server can constitute a permanent establishment to which income should be attributed for taxing purposes. As of the date this is being written, the Court has not published its determination. Australia has decreed that a server is a physical establishment. Therefore, if your server is in Australia your income flow will be taxed (this may explain why most Australian entities have their servers located in California). The United States, for federal purposes, has not issued any guidance on this matter. In the multi-state arena, the states seem to be agreeing with the Italian position. Besides the issue of compliance with many taxing jurisdictions and its corresponding costs, the Pandora's Box of how to allocate the income between the shrink-wrapped product and the possible Internet use is mind numbing.

2. Indirect Taxation

(EU) Digitally downloading software is becoming an acceptable means of distribution. Countries have begun to defend their bricks and mortar businesses. In May of 2002, the European Union (EU) adopted a resolution that as of July 2003, digitally-purchased and downloaded software will be subject to VAT (Value-Added Tax). The issue of whether a company is a resident and physically located in an EU country is no longer pertinent. All digitally downloaded software will be liable for VAT tax. The tax rate is dependent on the location where the software was downloaded. The EU will require companies that are not located in the EU, to register for collecting VAT in an EU country of their choice. The additional compliance costs of registering in the EU, purchasing software that will track where the game is downloaded, and then computing the appropriate VAT tax of that locale, will now need to be included in projected expenses. As of November 1st, 2003 Belgium is the only country that has issued guidance and regulations in regards to nonresident companies registering for VAT.

(US) The United States Congress is currently discussing if it will take a position in regards to digitally downloaded software. There are two bills in place: the first bill sponsored by Reps. Ernest Istook (R-Okla.) and William Delahunt (D-Mass.) on Sept. 25, 2003 unveiled long-awaited legislation (H.R. 3184) that would give states the right to require retailers to collect sales and use taxes on remote transactions if they simplify their sales tax systems. Many states have not yet decided if downloading digital software is a taxable event in that state.
On October 1, 2003 Rep Bob Goodlatte (R-VA), Rep Rick Boucher D-VA), and others, introduced HR 3220, the "Business Activity Tax Simplification Act of 2003", a bill that would limit states' ability to impose business activity taxes (BATs). It would require that a business have a physical presence in the taxing jurisdiction to be subject to a BAT. The Bill was referred to the House Judiciary Committee. The Department of Treasury regulations that discuss foreign source income and foreign tax credits have taken a similar position as the EU.
On October 15, 2003 Senator Mike Enzi (R-WY), Senator Byron Dorgan (D-ND) and others introduced S 1736, titled the "Streamlined Sales and Use Tax Act", a bill to authorize state and local taxing entities to collect taxes from out of state remote sellers, including internet retailers. Sen. Enzi and Sen. Dorgan also spoke in support of this bill in the Senate. Also on October 15, Senator Ron Wyden (D-OR) went to the Senate floor to warn that a version of the Internet Tax Nondiscrimination Act (INDA) being advanced by state and local governments would give state and local governments "explicit permission to tax what Internet users do once they get on line", including sending e-mail.

The State Sales Tax Project (SSTP) has determined that downloaded digital software is a taxable event. As of October 20, 2003 the Streamlined Sales and Use Tax Agreement (SSUTA) is now in effect because more than 10 states with 20% of the total population of all states imposing a state sales tax have enacted the conforming legislation that complies with the Agreement.

According to the California Legislative Counsel's Office, the following states, plus the District of Columbia, participate as voting members (implementing states) in the SSTP: Alabama, Arkansas, District of Columbia, Florida, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New Jersey, Nevada, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Washington, West Virginia, Wisconsin, and Wyoming.

The following states do not have a sales tax and would not participate: Alaska, Delaware, Montana, New Hampshire, and Oregon. One of the components of the act states that for nexus/state taxation purposes *any downloaded service is to be taxed by the state/locality where the end-user's customer's billing address is located*. It is easy for the states to expand this theory so that the service fees paid for PC online gaming are taxable in the state where the player is residing.

(Brazil) Though there is no exact opinion on this issue it can be inferred by The Supreme Court of Brazil decision entitled "Extraordinary Appeal No. 176.626/SP" as well as the State of Rio de Janeiro decree 27.307/2000 that ICMS (Value-added Tax on Sales and Services) is not imposed on download operations. Yet even with these decrees, Supplementary Law 87/96 can be interpreted that the computer where the software is downloaded can meet the definition of establishment.[23] As with the United States, A specific Decree issued by the Supreme Court is needed to resolve this issue.

3. New US Tax Legislation
   The Jobs and Growth Tax Relief Reconciliation Act of 2003 included an important change regarding computer software. In the past the IRS has let businesses deduct the full cost of tangible assets up to $24,000 as an expense. The new law changes that to $100,000 and more importantly, for the first time Congress included Computer Software. In addition to the $100,000 deduction, purchases in excess of $100,000 qualified for 50 percent bonus depreciation. The remaining 50 percent is then depreciated as usual. All of these changes are scheduled to continue for 2004 and 2005.

4. Taxes on the Wireless Market
   In the wireless market, once again the legal issue of nexus arises. Individuals are paying for services. One of the services can be downloading and playing games. This service could either be bundled or subscribed to separately. The EU will be treating these services similarly as it does for downloaded software (see above).

   The U.S. Federal government has enacted the U.S. Federal Mobile Telecommunications Sourcing Act. This act defines who has the right to tax services associated with mobile telecommunications. In brief, the address of the primary customer is what dictates who can tax the services provided. It is inconsequential if the services are subscribed to individually or bundled. As of this date, all states and the District of Columbia (except for Montana) have adopted this act and the sourcing definitions. There is some curious confusion in some of these states that have adopted this act though. Some states have determined that digitally-downloaded software is not taxable in their state. Therefore, these states have the legal right to tax that income flow but have chosen not to do so as of today.

   The game developer must determine if they want to have the right to download software directly to mobile telecommunications hardware or to license the software to a third party and get royalty payments. If downloading the software directly, the game company is responsible for the compliance costs of tracking the transaction, charging the correct tax rate and filing in multiple states. If the game company decides to license the product to a third party and just get royalty payments, the company may be liable in certain states based on the economic benefit rule. Either

[23] See also article 127, paragraph 1 of the Brazilian Tax Code

way, the cost of compliance must now be taken into consideration in projected expenses of game development.

5. IP and Taxes
   Utilization of a third party publisher may no longer shield the game developer company from U.S. multi-state taxation. It has been an ongoing battle as to who owns the intellectual property rights of a game. Developers have increasingly wanted to keep the IP rights. Certain states have determined that the use of IP rights in their state makes any economic benefit derived from those rights as taxable in that state. Therefore, developers now must weigh maintaining their IP rights against compliance costs of having to file and pay taxes in those states.

6. Tax Treaties
   In June 2003, Mexico determined and is taking the position that payments for acquisition of software are royalties and therefore should be subject to a 10 percent withholding tax. This stance could bring the country into conflict with double taxation treaty partners including the United States.

E. *Volunteers of MMOGs*

There are two US class action lawsuits pending against AOL and EA claiming that volunteers of MMOGs are really employees and should be paid as such. The first case of *Hallisey and Williams v. AOL, Inc*. was filed in May 1999 in US District Court Southern District of New York and the other was filed in September 2000 in the US District Court District of Colorado entitled *Katherine Reab, et. al. v. Electronic Arts Incorporated and Origin Systems Incorporated civil action 00B1839*. Until both these cases are resolved, it is unclear if by setting up "volunteer" communities in an MMOG, that the game developer may have unwittingly incurred substantial liability in back pay, payroll taxes and other possible fringe benefits. It was reported that the U.S. Department of Labor had investigated and dropped the allegations against AOL in regards to Hallisey and Williams' case. As of November 5, 2003, this has neither been confirmed nor denied by the US Department of Labor.

A few years ago, a multiplayer game provider also received a related ruling from the IRS. One of the game provider's offsite "GameMasters" filed taxes claiming that he should be treated as an employee and not as a contractor. The IRS investigated, but agreed with the game provider that the individual was correctly classified as a contractor, and not an employee.

F. *Summary*

As developers form and constantly re-evaluate their modes of operation, they should always consider the following things:

- A new game developer with no credibility or past successful games, may need to consider taking lower economics with their first game deal to establish credibility and recognition in the marketplace.
- Web games and Downloadable games are similar but each niche has unique considerations which should be addressed.
- For developers, some business models available in this space stand on their own (primary models) and some work best in conjunction with other models (secondary models).
- Developers should be wary of aggressively pursuing business models that put them in competition with their partners.
- Financial models are flexible and primarily revolve around risk. The more risk a developer is willing to take should result in better revenue streams if the product is successful.
- Selling IP can be very beneficial short term, but has many long term issues which should be considered.
- Partners who take the time to understand each other's businesses, are better able to provide maximum value and benefit to each other.

IV. Production and Design

A. *Introduction*

The web and downloadable segment of the game industry changes almost as rapidly as the web itself. Technology evolves, broadband usage increases, and every day, more and more players download their first game, or their fiftieth. In this section, we'll take a closer look at the production and design issues facing developers who are looking to make a successful title for this market. First, we'll explore the numerous constraints that affect the production of these types of games, the ways in which developing a title for this market differs from the development of a traditional retail title, and the risks inherent in these projects. From there, we'll take a closer look at game design issues, taking into account the target demographics, interaction patterns and interface, game mechanics and themes, as well as strategies for building player and brand equity.

B. *Production Issues*

There are numerous issues that should be considered when developing web and downloadable games. The following sections will discuss several of the most important ones.

C. *Project Constraints*

With their small scope, web and downloadable games provide a fantastic venue for exploring interesting core gameplay and the nuances of the balancing and tuning process. The lower financial stakes make it possible to explore a variety of innovative and unusual topics and game mechanics. However, even a small game can go wildly over budget and schedule without proper planning and management. Developers of web and downloadable game face numerous production constraints.

1. Money

Games developed for the web and downloadable market are typically smaller in scope than retail PC and console games. Project timelines are much shorter and budgets are smaller. Whereas it is not uncommon for a PC or console title to have a development budget of $5-10 million (US), downloadable games are typically produced for less than $50,000 USD. Publishers rarely pay advances for original downloadable titles, so the risk usually lies with the developer. Smaller budgets mean smaller teams in which each member must possess a diverse skill set. The implications of this are discussed in more detail below under "Process Differences".

Marketing games (aka "advergames") typically have a fixed budget that is restrictive relative to the desired deliverable. The clients who outsource these games are looking to get as much out of their budget as possible and may not have a particularly deep understanding of what it takes to develop a game. Skill games usually take the form of lightweight online games and have some additional constraints.

2. File Size

File size is an issue wherever digital distribution is concerned, and the mass-market audience targeted by successful games in this space is especially sensitive to large downloads. The most downloaded titles are typically under 5 MBs, and there is a sharper drop-off at 10 MBs. This is particularly relevant to those publishers who are looking to extend the lifespan of titles in their back-catalog; titles that were originally designed for retail distribution are usually quite large in file size. The size constraints for web games are much smaller, with a 50-500KB initial download being the norm.

3. Technology

While hardware support is a concern for anyone developing computer games, it is particularly important for the casual market, where players typically are not interested in buying special equipment to make games run better. Developers should assume that their games are being played on machines that are a few years old and that were probably not even state-of-the-art at the time of purchase. Sound and video cards are not as robust, processing speeds are slower, et cetera.

Since downloadable game budgets are not usually large enough to support the development of custom technology, many casual game developers use higher-level middleware such as Macromedia's Director or Flash to develop their games. With these environments, developers can produce both web and downloadable versions of their games from a single source. It should be noted that reliance on middleware does mean working within the limitations of the latest version of the software. These technologies are discussed in greater detail in the Technology section of this White Paper.

4. Demographic

The demographic for casual/downloadable games brings its own set of constraints to game projects of this kind. They include players with a wide range of computer skills, most of whom are not familiar with game genres or interface conventions from the traditional retail market. Their play patterns present a whole set of constraints, which we'll discuss below.

5. Deadlines

Since original web and downloadable games are usually self-funded, and the downloadable market is less sensitive to seasonal purchasing patterns, they are typically under less date pressure than a retail title might be. While this creates an opportunity to make the games highly polished before they are released, developers should be careful not to invest so much in the polish cycle that the games become unprofitable. Games that are created for a client, such as advergames, typically have a much more rigidly defined schedule, especially if they are tied to an external event, such as a movie launch or product rollout.

6. Special Skill Game Constraints

Skill games, that pay a cash award to the winning player, have some special requirements such as cheating detection and avoidance. Some of these issues are addressed in Steve Meretzky's case study below.

7. Summary

Clearly there is no shortage of constraints for the developer producing downloadable games. However, these constraints can also be viewed as potentially useful design parameters that can help focus the development team (and ultimately the player) on the essence of the game experience they are creating.

D. *Process Differences*

In this section, we'll discuss the production differences between web games and downloadable games, as well as how both of them differ from the production of other types of games (console, PC, etc).

1. Smaller Projects

Due to the reduced production layer in web and downloadable games, it is critical that the game be highly polished, tuned, and balanced. Since web games are relatively simple and the development environments for coding them often require few or no custom tools, it is possible to quickly create a working prototype of a game.

2. Smaller Teams

The smaller project size of web and downloadable games usually means smaller development teams in which each team member must wear multiple hats. The game designer or programmer may double as producer; the concept artist, lead artist, and art director may actually be the same person; and everyone on the team will put in time as a QA tester. As a result, management overhead may be reduced considerably and breakdowns in team communication can be less of a risk. However, projects may be more complicated to plan and budget when a single person is doing multiple tasks.

While the smaller scope of online and downloadable game projects would seem to make the project management simpler, in reality this simplicity is offset by the fact that most developers of such games need to produce several games concurrently in order to meet their cash flow requirements.

3. Working with Distributors

Although the distributor/developer relationship in the web and downloadable space is often likened to the publisher/developer relationship in the traditional retail space, they are actually very different, since distributors in the web and downloadable space do not typically share the financial risk of development. The developer assumes all of the up-front risk, while the distributor is typically not involved until much later in the development cycle when the game is nearly complete. However, even at this stage, the distributor can provide invaluable feedback and beta-testing resources to help guide the final tuning and polishing of the game.

For downloadable titles that are being self-funded by the developer, there is often no specific budget, but instead a more flexible number that evolves out of a compromise between the cash-flow reality and a sense of the product that is needed to compete in the marketplace. Developers working on self-funded original titles may be able to enjoy a more organic, iterative process of creating games. When a publisher's financial oversight is replaced by the developer's, the development process can be more flexible, but developers need to be careful to take advantage of this flexibility rather than fall victim to it.

Developers also need to be aware of the additional effort involved in working with distributors. Often, the distributor will require that their branding be incorporated into framing and peripheral elements of the game. For web games, developers may be required to integrate distributor features for server-based services such as chat, rewards/loyalty points, high scores, etc. For downloadable games, additional time will also be needed for wrapping the game within the distributor's Digital Rights Management (DRM) solution and possibly for producing promotional graphics and copy that can be used on the distributor's website. All of these things can add days to the end of the production cycle and should be planned for by the developer.

For online games that are being developed to promote a particular consumer brand or product, budgets and timelines are usually immutable and therefore call for a more formalized management approach. Also, a significant portion of the development time is often consumed in incorporating the client's brand identity and getting approval for the brand's representation within the game.

Converting Collapse to a skill-based game

Written by Steve Meretzky, Principal Game Designer - WorldWinner

In order to offer tournament games with a cash entry fee and a cash prize, performance must be based on a player's skill level and not elements of luck and randomness.

WorldWinner and GameHouse signed a deal to offer GameHouse's *Collapse* on the WorldWinner site as a skill-based cash game. Prior to doing so, both companies had to agree on modifications to the game to remove any elements of luck that were present in the free version of the game.

Although free *Collapse* was already primarily a game of skill, WorldWinner identified one area where luck came into play. As a player advanced from level to level, the game would speed up. Also, each level speeds up as it nears the end of the level. At some point, players will become overwhelmed and unable to keep up with the game's speed; naturally, this point will occur at different times for players of different skill levels. When a player reaches this point, the best strategy – indeed, the only strategy that allows the player to survive in most cases – is to click wildly and rapidly around the gameplay area, hoping to hit a chain of removable blocks. This is, clearly, a luck-based rather than a skill-based strategy.

WorldWinner's proposal was two-part. First, to have the game end after three levels (roughly equivalent to levels 2, 5, and 8 in the free version of the game) so that fewer players would reach the point of being overwhelmed. (This had the side benefit of shortening the average length of a game, allowing a given player to have more cash signups in a given period of time.) Second, we

argued that we should assign penalty points for any invalid click (that is, any click that doesn't result in the removal of a chain of blocks) in order to discourage wild, random clicking.

GameHouse, however, was unhappy with the second part of this proposal, since there are no negative points given in free *Collapse*, and GameHouse wanted the user experience to be as similar as possible for the free and cash versions of the game, and because there were actually situations where it was strategically advantageous to make invalid clicks. A compromise was reached where "wild" invalid clicks were distinguished from "non-wild" invalid clicks, and only the former were assigned penalty points. Wild invalid clicks were defined as the third or more invalid click made during a 600 millisecond period. The penalty was low for the first such wild click, but would escalate rapidly, thus strongly discouraging this luck-based strategy.

Cheating is a bigger issue in cash games than it is in free games. WorldWinner has a number of proprietary techniques that we use in our games, including *Collapse*, to deter cheating. This was particularly important for *Collapse*, a game whose design lent itself to automated play. Although these modifications are invisible to the player, they also represent a large portion of the effort of modification of a free game for skill-based cash play.

The cash version of *Collapse* was deployed on the WorldWinner site in mid-August 2003. It immediately became one of the two or three top games on the site. The anti-cheating protections have worked well, invalidating slightly more than 1% of cash games of *Collapse* (one of the highest rates of any game on the site).

It should be clear from the above that many of the same issues facing developers of console games (budget, project management, etc.) exist for developers of web/downloadable titles as well. However, the specific nature of these issues can be significantly different, as a result of differences in scale and business relationships.

E. *Risk Management*

Most downloadable games are self-funded and therefore developers are not beholden to an investor/publisher. However, without distributor buy-in and promotion, there is little chance of profiting from this development. Given that the time and costs involved in building a web/downloadable game are much lower than for a typical standalone PC or console game, risks are not usually managed as assiduously here as in other areas of game development. *Developers should be careful not to let the illusion of reduced risk lull them into a sense of complacency in their risk management.*

1. Play-testing

Perhaps the greatest risk facing a game developer is that players will not have fun playing their game. For this reason, play-testing and beta-testing is a critical risk management technique and should be an integral part of every developer's process. At the early stages of development, developers can utilize their network of friends and colleagues to get feedback about playable prototypes via email. As the game matures, a larger group of play-testers should be tapped, with greater consideration given to the questions they are asked in order to elicit feedback. Allowing testers to play the game and respond via the web is a great way to collect a high volume of feedback, but should not be used as a substitute for watching over the shoulder of a play-tester as often as possible. Each of these approaches should be used throughout the development process to identify problems with the game play or game interface, common frustrations or areas of confusion, and tuning and balancing issues.

Keep in mind, play-testing is a soft science and is most useful in its role as red-flag raiser and dialogue-starter. Developers who are reluctant to make refinements to a game once the project is underway, often need only watch a tester struggling in frustration to find the motivation they need.

2. Market Research

Just as writers need to read, game developers need to play lots of games. For development teams, playing and critiquing games together is a great way to stimulate new ideas and to grow a vocabulary of references that will make it easier (not to mention faster) to discuss their own games. Analyzing non-game interfaces that are used by the target demographic can also help identify “best practices”, or at least widely familiar conventions.

3. Working with Distribution Partners

It is critical to leverage the developer/publisher relationship in order to maximize the likelihood that a particular game will succeed. Distribution partners have the advantage of analyzing the download and conversion data for their entire catalog, and can help identify key features that are affecting these numbers. They may also have plans to focus (or not) on a particular area of their catalog (i.e. sports games). The developer should try to start this dialogue as early as possible so that any guidance can be taken into consideration early on in the process. However, it is also worth pointing out that if mishandled, this type of risk management may discourage real innovation and foster a homogenous, undifferentiated field of games. While distributors recognize the importance of innovative games in growing a base of repeat customers, the risk aversion that is typical of those larger companies may not support this idea, or the distributors may have specific ideas about the flavor of innovation that they’re prepared to support.

Publisher/Distributors will often pay a higher royalty in exchange for exclusive content, but developers should weigh the benefits of an exclusive deal against the smaller audience it implies. In other words, it is often better to get a lower rate, in return for being able to distribute more widely.

There is an innate tension in the developer/distributor relationship that grows out of divergent goals. The developer is interested in selling as many copies of their games as possible, and so benefits the most from steady promotion over a longer period of time. The distributor, on the other hand, needs to keep their content fresh and tries to keep players returning on a regular basis (particularly if they are also selling advertising space). Unfortunately, this churn rate further restricts the genre, scope and depth of the games that can be profitably released into the market by effectively limiting the return of a given game on a given channel. However, by recognizing this situation and working with the distributors, the developer can devise strategies for working around it and maintaining the placement of their content through level-packs and other add-ons, web versions, et cetera. These strategies should be considered early in the development cycle to come up with the best solution.

4. Managing Clients

In the world of advergames, ad agencies will impose their sensitivities along with the sponsors/licensors, so approvals may require additional time. A more disciplined approach to project management has a clear benefit when there is a fixed project budget, as is usually the case with these games.

For marketing-based games, managing client expectations is the most critical area of risk to manage. Additional effort put into detailed design documents and interface mockups can go a long way towards streamlining the approval process and minimizing the number of change requests once the software is in production.

5. Technology Choice

Changing technology is an issue with all forms of digital games, but it is particularly exacerbated in a web environment. Web developers must contend with a dizzying variety of OS's, browser versions, processor speeds, connection speeds, and plug-ins. Currently Java, Flash, and Shockwave are the norm, and the time required to download and install any new plug-in can turn a player away from your game. For marketing games, the client will often have information about the target audience that will influence decisions about which technology to use. For downloadable titles, developers should choose a technology carefully by keeping in mind the hardware limitations that may exist within their target audience. Technical considerations are covered in much greater depth in the Technology Overview section of this paper.

6. Smaller Project Size

The smaller project size in online/downloadable projects reduces the financial risk somewhat, although even a budget that is tiny in console development terms can represent a significant amount for a small development shop.

Larger projects tend to be riskier because of opportunity cost, resulting in higher requirements for a single title to perform. Thus risk management may play as big a role as bandwidth does in limiting game size/scope.

7. Design and Development Methodologies

Developing a more formalized approach to both game design and game development is a risk management strategy that all developers should explore. Obviously, a rigid methodology will not apply to all game projects, but some guidelines can ensure that common (and costly) mistakes are avoided. See Nicole Lazzaro's case study later in this section, for an example of one developer's more formalized approach to the design process.

CASE STUDY ***Representing a PlayStation 2 game on the Internet***

Written by Simon Oliver, Head of Research and Development Random Media

Random Media has worked on several web sites for PlayStation 2 games published by SCEE. This case study will discuss one of the most recent sites we have, for *EverQuest Online Adventures*, at http://www.eqoa-game.com.

The aim of the site was to provide an experience of the PS2 game, rather than just provide information and screenshots and the usual material found on games sites. This information is already provided on the PlayStation.com site, allowing us to concentrate on providing an engaging experience to the user.

What we wanted to do with the games aspect of the site was to communicate some of the key aspects of the PS2 game without attempting to replicate the game wholesale. Trying to reproduce a game such as *EverQuest* within a browser would obviously be an impossible task, and the end result would only cheapen the game itself. By sitting down and playing the game and researching online about what people thought of the game and the community surrounding it, we were able to get a feel for the most interesting aspects of the game, enabling us to piece together a game design that would reflect these aspects.

Some of the most striking aspects of the game were the community aspect (*EverQuest Online Adventures* is one of the flagship PS2 titles compatible with the new network adapter), the strong emphasis on teamwork and the open-ended nature of the game (the game never ends, new content is constantly created by the players and by the game's developers)

Game Design

The first aspect to be tackled in the game design was that of teamwork. Within the game, many people join together to form "parties" in order to tackle the bigger challenges in the game that would be near impossible for someone to complete on their own. There have been numerous games in the past that have placed teamwork at the center of gameplay. *Head over Heels* and *The Lost Vikings* are great examples. The idea of these games is to combine the unique abilities of each of the characters in order to solve puzzles and progress through the game. This is something that lends itself very well to *EverQuest* as within the game there are numerous classes and races each with their own abilities, strengths and weaknesses (for example trolls are very strong, but not very intelligent, or elves have an affinity with nature). We decided to go down the path of creating a game that relied on the player strategically controlling different characters with

different abilities in order to solve numerous challenges. This would emphasize the concept of "parties" in the main game.

Because of the nature of online gaming, the game design needed to be kept simple in terms of control and complexity in order to stir the interest of the casual browser without scaring them away. You also have to contend with a huge range of different machine specs, and so trying to create something with as broad an appeal as possible can be a challenge. To reach the low-end range of machines we decided to focus the design away from anything too arcade-like and instead onto something more cerebral.

The game design is influenced by block games such as *Sokoban* and especially *Catrap* on the Game Boy. These games are perfect examples of how a few simple rules can create incredibly complex puzzles. They are very easy to pick up initially but provide a great deal of depth – perfect for a web game. Elements of these games were combined with elements from other teamwork-centric games (such as swapping between characters) to create the game design used on the site now. Initial versions featured more character types with different abilities, increasing the number of rules in the game, but in order to make the game more accessible, these were cut down to a minimum.

In order to recreate the open-ended nature of the PS2 game, the natural solution was to give people the ability to contribute to the site itself. While we could have regularly produced new levels for the web game, it would have been time consuming for us, and by empowering the users of the site with a decent level editor, the potential for new content was much greater. Plus with a wider audience you are guaranteed to get people creating levels and puzzles in ways you never would have thought about yourself if you are close to the project during its evolution.

EQOA on the PS2 has a large emphasis on community. Your social standing and the level of power and strength you have place you in a natural ranking system. In order to showcase people's abilities within the site, we added the census, allowing you to see how far you are from the top, and browse the real champions of the site as well as playing their quests. The scoring structure took a lot of consideration to make fair, and in the end it comprised three elements: The popularity of the quests you create, your total score on all the other quests available, and your score on the predefined (legendary) quests. This also meant that in order to stay at the top of the census you had to continually play all the quests on the site, which tied in nicely with the same notion in *EverQuest* of needing to play the game frequently to stay on top.

Translating the PS2 Game Art Direction to the Online Game Engine

The assets within the game engine were driven by the assets used in the PS2 version. We were fortunate enough to be able to request assets from the game's developers. As a result we were able to obtain textured Maya models for the different character types within the game as well as a number of environment models and textures.

At one stage we were going to have the players represented as static "pieces" on a playing board, to abstract the game so that it felt more like you were playing chess, and take it away from representing a realistic environment. It can be dangerous trying to recreate assets from within the game as they can look like poor imitations and hence represent the artwork poorly. If you do not have assets available, it's much better to try and produce stylized versions of the original graphics rather than exact duplicates. With access to the original assets, however, we felt comfortable translating them to the web.

F. *Design*

In the following sections, we'll take a closer look at: the target audience that web and downloadable games are typically designed for, the mechanics that have seen popularity within the market, some guidelines for user interaction, and desirable game features.

G. *Target Audience*

The remarkable growth of the downloadable games market makes it clear that a previously underserved market is being reached. Considering that the *potential* audience is anyone that happens to use the web, the audience for web games is generally much broader than retail games.

This audience has a different relationship to the computer than hardcore gamers; they have fewer expectations, but also less familiarity with gaming conventions. They do not self-identify as "gamers". If they have played videogames before, the content has not maintained their interest.

Although it can be assumed that with each new title they play, this audience becomes more sophisticated, this is not to suggest that ultimately they will evolve, nor should we force them to try to evolve, into hardcore gamers. At its core, this is an audience with different tastes, different patterns of consumption, and different requirements for their gaming experience.

Additionally many players look to these games as a way to have a short fun experience, and are either unable, or uninterested in spending hours on a single game. Keeping this in mind by providing easy access to pausing the game, and even allowing players to save their progress in games that take more than five to ten minutes, can greatly increase user satisfaction.

H. *Game Mechanics*

This section will identify those qualities that recur in casual games, providing specific examples and speculating about the particular types of 'fun' that the casual player is looking for. Finally it will touch upon the evolution of both the game mechanics and types of fun. Game themes and user interaction are discussed in their own sections.

In the case of web and downloadable games, and particularly those that have seen marketplace success, we can identify a handful of mechanics that can be found in the bulk of the titles on offer at any given time. Here are a few examples:

1. Match/Align

Player must create groups of three-or-more objects by swapping, dragging, or shooting them into place.

Examples: *Bejeweled, Snood, Walls of Jericho, Mah Jong Solitaire, Congo Cube, Chomp Chomp Safari, Atomica, Cubis, Hexic*

2. Identify Groups

Player must identify existing groups within a pool of possibilities.

Examples: *Collapse, Avalanche, Qbeez*

3. Find/Order Subsets

Identify and order subsets of objects within a rule-limited pool of possibilities (such as the alphabet, or a deck of cards)

Examples using words: *TextTwist, WordWhomp, SpellSpiel, WhatWord, Word Up, Spelvin, Wild Wild Words, BookWorm*

4. Arcade/simple reflexes

Examples: *Breakout, Blasterball, Rebound, Atomaders*

Note that even among these mechanics, there is significant overlap and one might simply use "grouping" to describe the first three mechanics outlined above. However, the point here is not to elaborate a comprehensive taxonomy, but to highlight both the types of interaction that have proven themselves successful in this market and the relative homogeneity that has resulted. Clearly, other categories of games exist such as casino, trivia, jigsaws, etc.

Evolution and innovation in the downloadable market has historically proceeded in overlapping baby-steps. The market is flooded with games that are obvious derivations of existing titles, often distinguished only by their theme and aesthetic. While the audience has demonstrated a remarkable tolerance for this homogeneity, it is possible that the novelty will wear off and new varieties of gameplay will be necessary to maintain their interest. While some successful titles have innovated by introducing a variation on an existing mechanic, or combining several of them, there is also room to innovate in a completely different direction. Either way, innovation in game design must not come at the expense of good user interaction design. Players who spend all of their energy figuring out how to work with a game's interface will never discover the innovative game mechanic that lies behind it.

I. *User Interaction*

Successful casual games are typically controlled exclusively with the mouse and provide the player with "perfect information", or the ability to see everything they need to see on screen at once. Interaction with the game objects is intuitive and predictable. The game does not require that the player "experiment" in order to learn how the game works. However, it also is forgiving of misclicks, should they occur. In other words, casual games tend to be 'friendlier', allowing even novice game players to quickly develop a sense of control over the play experience. While games can gradually introduce more complex styles of interaction over the course of play, it is critical that the initial moments of the game experience are distilled down to their most basic essential components, and supplemented with straightforward (brief) instructions at just the right moments. Players cannot be expected to read through verbose instructions, so it is crucial that the interface communicate the flow of the game.

While many casual games players also play traditional PC and console games, a large portion of the audience does not. As a result they do not have years of previous gaming experience to serve as a basis for their gaming expectations. While this lack of expectations has the potential to allow titles featuring innovative forms of gameplay to achieve success, it also means that developers must be careful not to rely on game interface conventions or mechanics from traditional PC and console titles. The same abundance of game choices that would be welcomed by hard-core gamers will likely only irritate many casual players. Furthermore even seasoned traditional gamers are likely to be looking for a simple quick game, as opposed to a drawn out affair, making a simple easy to grasp game concept and interface extremely important. While casual gamers appreciate a customized experience, they do not want to be forced to do the customization themselves.

Since most game developers, even those creating titles for the casual market, tend to have years of play experience in a wide variety of game genres, it is important to become aware of a tendency to design for oneself and one's peers. Again, the importance of beta-testing with players from the target audience cannot be overstated.

1. Designing for Upsell

Developers hope that players will pay for these titles, so they must offer a compelling play experience that feels significantly richer than their web counterparts. Often players will first experience the game via an online version, and then download and install the game on their PC as the next step. Players typically proceed to the downloadable version for one or more of the following reasons:

a) Higher quality experience
Offline play is usually full-screen and advertising-free, typically with enhanced graphics and sound.

b) More competitive or instructional gameplay
Downloadable versions of games can offer more levels and deeper gameplay. They appeal not only to competitive players, but also to players who want to learn more about the game. Downloadable versions can include "untimed" or "puzzle" modes that cater to players who want to improve their

gameplay. Whether for skilled players or those eager to improve, good game design should provide a path for all levels of gamers to build loyalty to the game.

Designing games that invite player loyalty is covered in significantly more depth under the "Brand Equity" header later in this section.

c) Accessibility

Offline play does not tie up phone lines, which can be important for the majority of the audience on dial-up connections, as well as laptop users who may not always have an available internet connection. Games that have been downloaded to a laptop can be played while traveling, and other times when an internet connection might not otherwise be present.

J. *Themes*

The choice of thematic context for web/downloadable games can be the crucial factor in the success of a particular title. Developers need to think carefully about where to position the game in the aesthetic spectrum (light/dark, fantasy/reality) and take into consideration other forms of entertainment, such as movies and fiction that have proven popular with their target demographic. Is the best-selling book within the target demographic a space-themed action novel? Which genres of movies perform the best? What magazines do they read? All of these questions can help the savvy developer answer other questions: what does the audience care about? What do they like to do in the real world? Obviously, having the answers to these questions will not guarantee success for a title, but they are the first step towards designing a product that players want.

While there are no hard rules, and individual player preferences are as varied as the audience itself, some general guidelines are useful:

- Games for the casual market should not contain explicit violence.
- A brighter 'mood', and an upbeat look and feel are more compelling.
- Connect the game with something that the audience enjoys in the real world (including non-digital games) in order to provide a comfort zone.

1. Use of Characters and Narrative

Although the majority of casual games don't tell a story, and some don't even have characters, both can help the users get involved in the game and forge an emotional connection with the gameplay. If incorporated poorly, however, narrative can disrupt play and distract from the focus of the game. An important balance will need to be achieved for casual games. Games like *Digby's Donuts* or *Lemonade Tycoon* have used a light narrative to build player investment in the experience.

K. *Game Features*

As mentioned above, distributors can be an invaluable resource when it comes to understanding the needs and desires of the target audience. RealArcade has set forth the following list of recommended game features.[24]

RealArcade Game Design Recommendations

The following are paraphrased from the RealArcade website:

Front-End UI—It's crucial that menu items are clearly labeled. When picking names for game modes, try and stay to familiar terms like strategy, puzzle, speed instead of creating new and unique titles. Challenge mode isn't as good as Play Now. Players should be able to get into the game with not more than one-click from the main menu.

[24] http://gamedevs.realonearcade.com/esd/ingame.htm

Any stumbling through the UI or additional steps will likely turn people away in the try before you buy arena.

Core Gameplay Concept—The core gameplay concept should be immediately obvious to the player. Taking ten people off the street and asking them to play your game for the first time, they should all be able to figure out how to play, what the objective is, and how to achieve success in the game in less than 2 minutes. People simply do not read manuals that come along with the game; if they can't figure it out, you lose them quickly.

In-Game Tutorials—These take many forms. In general a full blown interactive tutorial should not take longer than 2-5 minutes to complete. Anything longer and the game is too complicated and there is too much to learn in a quick sitting. Consider removing game elements and adding them in as the user progresses. Quick pop-up help is good, especially when it's contextual and relevant. You can spoon feed the user through the game this way, introducing new concepts as they come up, at the start of a level for instance.

Addictiveness—This almost goes without saying, but it's important to remember that the top selling games in this space are often described as addictive. What makes a game addictive? It's a combination of a number of things: graphics, sound, gameplay, and ease of use. In short, it's a combination of all the areas of game design.

Mouse Control—The easiest form of control is the mouse. Every user, no matter how new to the PC, uses the mouse. It's crucial that the entire front-end UI is mouse driven. Games with core game play that is point-and-click have a huge advantage in this space. It's not just enough to have mouse control, it's worth spending some time thinking about how you use the mouse. The control needs to be intuitive and smooth. It can be quite a challenge to find ways to use the mouse, but the payoff is well worth it.

High Scores—Scores take two forms, local and global. Local high scores is a must have with any quick paced game where scoring is the core motivator for play. The ability to reset local high scores is important as well. Score is a good psychological motivator as the player will continually try and beat top scores. Global high scores are less important, but a growing number of players in this space like to see how they stack up against the rest of the world.

Save Games—In many cases it makes sense to have the ability to save games. As a rule, if your game takes longer than 15 minutes to complete, users will enjoy a save game feature. This is especially true of word games, jigsaw puzzle games - anything where it is likely you will not be able to complete in a session. It's also important that you make sure there is a valid reason for the game taking so long because in general anything that takes longer than 15 minutes to play will not resonate in this audience.

L. *Building Equity*

This section covers strategies for building and maintaining brand equity in the online gaming space, especially from the standpoint of making games. For example, what are some of the key ingredients involved in making successful online game brands that are “sticky”, i.e., games that are habitual, accessible and foster high levels of engagement with players?

Brand equity is here defined as the added value that establishing a recognized brand name identity brings to an online game product, a series of interrelated game products, or directly to an online game developer, publisher, or distributor.

From the consumer perspective, another way to look at brand equity is the degree to which an online game developer or publisher is successful in generating (ideally positive) associations, memories and experiences that a user identifies with their company or game brand. The more online game developers and publishers are successful in connecting these moments of positive interaction, whether as part of a given game-playing experience or across multiple brands, the more they can grow their reputation and prominence. This goes for both the public-at-large and industry peers.

Of course, a number of mitigating factors can come into play, whether due to flaws in game design or problems with a business plan, resulting in weak, inconsistent or non-existent brands. Online game developers, publishers, and third-party distributors can, however, follow certain key strategies for building brands, whether considered in terms of overall company identity or game titles they launch and promote.

Although the main focus of this section is on achieving brand equity through game design, features, game upsells and promotion, a multi-tiered strategy for achieving brand equity includes a solid plan for all of these areas:

1. Making Games that "Stick" – What game design features foster brand loyalty and help grow a company's reputation?

2. Business Plan – What plans are in place for developing a brand-focused business?

3. Brand Equity Measurement & Analysis – What methods are in place for measuring and forecasting brand success?

4. Intellectual Property – What investments have been made to protect intellectual property?

5. Marketing / PR – What plans are in place to generate "buzz" around the games and the company?

6. Interaction with Customer (where applicable) – Are interactions with your customers (e.g., customer service, direct mail) enhancing or detrimental to the brand equity strategy?

These factors are considered in greater detail below.

1. Making Games that "Stick"

The online and downloadable games market is a mass audience, hits-based market, and a developer is only as good as their last great title. That means it is essential to have the sensibilities necessary to create highly entertaining, enduring, and generally accessible content. In short, trying to make sure a game has what it takes to become a successful brand. Here are some high-level considerations to take into account for making successful online games:

a) Reputation

Future success is partly based on a good track record. A developer or publisher should try to have a reputation for putting out consistently high quality, entertaining content. A customer who had a great experience buying and playing one game, is more likely to purchase and play games from that developer in the future.

Other developers may attempt to capitalize on a specific niche. For example, PopCap Games might conjure associations with puzzle games because of a great track record creating entertaining and polished brands, such as *Diamond Mine* or *Tip Top*.

Other developers such as Skunk Studios are known, for building game brands around unique characters, given previous games with a strong character component, including *Spelvin* or *Tamale Loco*.

More than just one factor comes into play for making successful and long-lasting game brands. If a company has a core competency that stands out, beyond simply striving for an excellent product, then they should find ways to strengthen that association throughout the company and brands.

b) Entertainment Value

Long-lasting game brands must possess some kind of entertainment value. Spend the time needed to design a streamlined game mechanic that is fun and lends itself to habitual play.

Developers should also consider that what might be fun for a more traditional console-playing game audience may not work for players who typically buy downloadable games. Games that seem to perform best in this space are ones that are considered relatively easy to learn but difficult to master.

For power players, a game should include additional features that increase the depth and complexity of interaction, should they seek it out. These additional features complement the need for simple controls and basic gameplay.

Examples of "power player" type features:

- In the word game *Text Twist*, there are several layers of playing strategy that players can adopt, depending on how 'deep' they want to get into the game. For example, spelling a 7-letter word automatically allows you to advance to the next level, and this requires a certain skill. Players who want an easier experience can still advance levels by spelling many shorter words to advance, and possibly not have to think as much about it.
- *Gutterball 3d* is a bowling game that gives advanced players the opportunity to customize the weight, speed and spin of their bowling balls to get just the right 'feel' for bowling a game.
- Features that unlock over time or can be expanded upon through additional downloads, when part of an overall brand roll-out plan, are another way to encourage a player's long-term investment with a game brand.

Finally, to understand what hold a brand may have over time, developers should take the time necessary to play-test games with players who sign up to be beta testers.

c) Accessibility

Particularly with the casual online game market, accessibility is key to designing brands with longer-lasting equity. A game has about 30 seconds to grab a player's attention, and games that fail to do this might lose a player forever. Following certain guidelines to increase the accessibility, results in a greater likelihood that players are going to bond, habitually play, and hopefully purchase, the games.

Tools such as help, in-game tips, tutorials and easy-to-find options ought to be easy to access so anyone picking up the game for the first time is effortlessly guided through the first few rounds of playing the game. Similarly, most players will not know where to look for the Options menu, so it's important to give users easy access to their options.

Games should challenge, but not "kill" new players in the first ten seconds of play. Difficulty that ramps up over time allows newer players the opportunity to play and learn the game. Another option is to allow users to choose their skill level for a given game.

Find ways to integrate all levels of communication to the user regarding how well or poorly they are doing in a game. Do this both visually and aurally to make tracking progress transparent.

For example:

- In PopCap's *Bookworm*[25] , a player knows their time is up if a "burning" tile reaches the bottom of the frame. This highly visual metaphor leaves no room for guessing how well a player is doing during a given game.
- Adveractive's *Atomic Pongling*[26] combines the familiar form of bowling with a breakout style metaphor. For players, scoring and game progress are visually implicit to the overall design. There's no question as to what a player needs to do or how well they are doing it.

[25] http://www.popcap.com/launchpage.php?theGame=bookworm

One way players should not be challenged is in figuring out how to use the controls. One of the fastest ways to lose a new user is to confound them with complicated controls. Complicated key controls should be avoided at all costs.

d) Polish

Another way of building brand equity is to give products extra polish before releasing. Great games take into account all the moment-by-moment interaction possible and aim to deliver at every turn. This goes for art, audio, gameplay and the overall seamlessness of the experience.

Examples of polished games:

- *Sveerz*[27] allows players to customize a computer voice to say things like the player's name in place of the default audio. This innovative touch, while not necessary for the gameplay, makes the game stand out thereby adding to the value of the brand.
- *Congo Cube*[28] by MonkeyStone is yet another title that layers fun gameplay with lots of special touches and features, providing players with high quality moment-to-moment interaction. At no point while playing this game is a player left out in the cold with a dull and lifeless game.

Here are examples of ways in which publishers and developers create positive, interlocking experiences that add value to their brands. The underlying idea is to increase user commitment relative to cost of purchase.

For a Downloadable Game Demo:

- Be a tease! Make sure players know what they are missing by not owning the full version of the game, but do not do this in a way that detracts from the overall playing experience.

Within a standalone game:

- Reward players the longer they play. For example, unlocking levels as a player progresses
- Give players a means for tracking their progress over time through game stats and rankings.
- Give players a means for competing with other players. For example, through high score boards or a hall-of-fame
- Give users a variety of ways to play your game, whether on new emerging media platforms (e.g., mobile phones) or as skill-based games, for example.

For a given product line:

- Provide players with sequels and expansion packs for an existing title that have clear and discernible feature upgrades
- Give discounts to existing players of a game, when they upgrade to a product update or sequel.

For a series of related games:

- Cross-promote among games
- Give them certain shared design elements to communicate their relatedness

Other

- High Scores & Statistics appeal to a player's sense of competitiveness and desire for status.
- Provide easy customization such as remapping game keys, toggling between full-screen and windowed, or anything else that users may wish to customize while maintaining the integrity of their play experience.

---

[26] http://www.playtonium.com/pongling/
[27] http://www.skunkstudios.com/sveerz/
[28] http://www.congocube.com/

- Find creative ways to allow certain features or elements in a game unlock over time. For example, when creating a game that is a retro-style space arcade shooter, perhaps certain power-up elements or creatures or worlds will only be available as the player progresses through the game.
- Features that are shared among multiple titles (e.g., Hall of Fame)
- Similar logo, character/mascot, or name/font. When done properly, developers can leverage their existing successful brands to help sell new products. When implementing this, care must be taken not to dilute or degrade the original branding. A good example of this is Nintendo's use of Mario across product lines.

e) Additional Factors Related to Brand Equity

In addition to branding a piece of content, other areas in which users interact with a game developer, publisher or product line influence the success or failure of building brand equity. Direct marketing, a strong Internet presence, press coverage and also the quality of user experience in e-commerce or customer service situations can influence the value of a brand.

(1) Business Plan

Building brand equity requires a plan. In addition to creating highly entertaining and accessible content in the online gaming space, starting off with a solid business and production plan, with enough built-in flexibility to respond to market forces, is key.

Rather than seeing each title as a one-off game, take a lesson from the "traditional" game industry and regard each brand as potentially spinning off any number of sequels, extension packs and add-ons.

In addition to seeing each game as a brand for which to cultivate longevity and interest among players, it is also extremely important to view each game brand as an interlocking network of titles associated with both the development studio and all the other games they release.

(2) Brand Equity Measurement & Analysis

On both the front- and back-end, establishing measurement tools for assessing whether brand equity has been achieved, beyond anecdotal buzz factor, is also key. The additional value that brand equity lends to an online game or company can be generally understood as a network of interrelated indices.

Customer acquisition and retention:

- Is the developer taking every opportunity to capture as many new customers as possible?
- Are the existing customers likely to become repeat purchasers because of the strength or the brands?
- Do customers buy a variety of games or are they just loyal to one brand?

Revenues and cash flow

- Is the developer making money?
- Can the business be run on the revenues generated with the brands?
- Does the developer have enough cash flow to maintain the brands (and pay competitive wages to the staff)?
- Is there enough revenue to continue developing new products?

Product-line lifespan

- Is the game good enough to warrant an investment in branding?

Overall presence in the online gaming space among peers, competitors and the public-at-large.

- Does the developer have a reputation for compelling content?
- Do people associate certain kinds of games with the company, and are they likely to seek these titles out because the games have the developer's name attached to them?

(3) Intellectual Property

What investments have been made to protect intellectual property? Anyone who is serious about building their brands should copyright and trademark those brands. For anyone serious in building a brand-based business, it is worth the time and money to learn about intellectual property laws and to find a good intellectual property lawyer to make decisions that are in the best interest of the company and its brands.

(4) Marketing / PR

Online game publishers and most developers must have a focused marketing and promotions plan to keep the buzz alive about a given brand and company, rather than just on relying on users to come to them. Direct mail correspondence, coupons, loyalty/incentive programs, community-building and other viral activities (e.g., tell-a-friend), philanthropy and press coverage on the company and games are a few examples of ways to stay fresh in the public eye.

(5) Customer Service

When a player contacts a publisher or developer, the response this player receives, whether positive or negative, will influence their associations with that game as well as the likelihood they will become a repeat customer. As such, it is very important that all communications with players are prompt and courteous.

How to build a great Internet game

Written by Nicole Lazzaro, XEO Design

Based on XEO Design's independent research of casual and hard core players, there are four key elements to player experience design. The game experience offers emotional and social benefits by challenging and immersing the player. Not all games offer all four of these in equal amounts, but the more popular games often offer some aspects of each.

Offer Challenge

"It is easy to tell what games my husband enjoys the most. If he screams 'I hate it. I hate it. I hate it.' then I know he will finish and probably buy version two. If he doesn't say this, he'll put it down in an hour or two." –Wife of a Hardcore PC Gamer

Many people play games to test their abilities and to grow. They like that a game requires their full attention and enjoy the process of building skills and improving their score. Games must balance player skill with game difficulty; as well as manage player moods, walking a fine line between frustration and boredom. Players like being challenged mentally and physically, and online games offer mental and action challenges. Action games emphasize motion and time limits, while mental games focus on puzzle solving and pattern matching. Some online games such as *Collapse* and *Pop It* offer both action and puzzle modes. Additionally, players respond to simple premises in online games. Make sure the goal of the game is immediate and obvious. Even if the long-term goal such as clearing the board will take time, offer intermediate goals such as clearing a row so the player feels they can make progress.

Ideally games should be easy to start and take a lifetime to master. The most popular online games offer a simple game mechanic in a game world that gradually increases in complexity. For example in *Collapse* it is simple to match three similar squares so players succeed right from the start. As a player improves, the game board and objectives must change to maintain a higher level of challenge. Games that offer levels or challenge ladders will be played longer. Offer levels and other challenge ladders to maintain an appropriate level of challenge and test these changes

with real players. In addition to increasing the pace and the number of targets, also offer new challenges, power-ups, special moves, goals, obstacles, behaviors, and strategies. Have the game change over time so there are always new things to learn; such as the addition of new elements as play progresses. Examples: bombs in *Collapse* or coins and gems in *Rocket Mania*.

Player needs and preferences change as they become better at playing. Offer mastery and accomplishment and progress to a goal in a way that the specific player type enjoys. Consider allowing experienced players to skip the intro levels or provide difficulty settings. If the beginning levels do not offer enough challenge, players may leave the game because it takes too long to get to the game play they enjoy. For experienced players offer new challenges, not just more targets with less time. For example, *BookWorm's* burning letters add challenge with a new dimension to gameplay; but later in the game the board fills with "U"s and "Y"s which makes play nearly impossible -- not just challenging.

Remember the player's score and name if appropriate and allow them to achieve a new personal best.

Encourage Immersion

"*I'm not into keeping scores and competing with people. I like the sound of cards shuffling and the rhythm of dealing them out." – A Casual Solitaire Player*

In addition to challenge games, offer an opportunity to become completely focused on an activity. Many people play to stimulate their senses and their mind. Some play to take their mind off things for a while. The process of immersion offers a counterpoint to challenge where it encourages mental engagement without as much effort or skill. Often this feeling of immersion has a meditative quality as players focus their attention on the experience for its own sake. The moves are often short and repetitive with sound effects. These aspects reward closer examination of detail such as in *Bejeweled*. The sound effects and artwork bring pleasure through use as in the sound of *BookWorm* eating the letter tiles. All of these factors help suck the player into the game.

Just as players enjoy different types of challenges, players also enjoy different aspects of immersion. The controls and game objects should fascinate the player and feel so good and satisfying that the player would interact with them even if there were no game involved. Make successes such as clearing the board look, sound, and feel good in addition to score. *Collapse* fills the empty squares with bonus tiles while playing sound effects and ends with a bowling alley pin clearing sound effect.

Inspire a wide range of emotions

The primary benefit of playing on-line games is an emotional experience in the player. People play to change their emotional state, whether it is to feel amusement and excitement, to feel empowered and better about themselves through success, to express their workday frustrations, or to calm themselves after a hard day. Within bandwidth constraints, a higher realism in artwork and audio offers the opportunity for more emotional realism in the player.

Many player emotions come from success in game. Game design must balance frustration and anger with positive emotions to keep players engaged. If they stop mastering new challenges they will stop playing. Create emotions through doing and experiencing, not just from animations or high scores. More than challenges; enjoyment also comes from the pleasure of experience, sensory behavioral and reflective emotions coming from the game's art, aesthetics story, and ownership. Not just better quality graphics, audio, and sound; but media elements that integrate with the game's theme and enhance the player's experience. Use art, concept, and sound to create emotions in the player such as collecting jewels in *Diamond Mine*.

Players respond to the emotions expressed by other players as through chat. Feedback from the game or a game character can also affect how the player feels, such as in *Rocket Mania* where the old Chinese dragon says "Get Ready!" at the start of a round, or "Well Done!" after a particularly good move, or when the game advances the player from "Inquisitive Child" to "Young Salamander" to "Curious Badger". These aspects evoke different player emotions and keep them encouraged and engaged.

Offer enough context and story in-game without bogging down game play. Ideally emotion in games should come from doing, not from watching. If cut scenes or animated sequences are used, make sure experienced players can skip them. Similar to a film where mixing emotions increases the intensity of the experience, offer a variety in game elements such as the different types of foods in *Tamale Loco* (Shockwave.com) that keep the game from being too repetitive. The excitement in the audio ("Cheese!" "Onion!") is contagious making the player smile, while the unusual combinations such as pickles for a burrito create emotional responses as players imagine what that might taste like.

Support Social Interaction

"Shared Experiences are Compelling Experiences" — Walt Disney

In addition to player emotions, another major benefit of games is social. People play to connect to others or to have something in common to talk about after the game is done. Games are often shared experiences either during game play or afterwards. Interaction between players increases challenge as well as emotional responses. Games increasingly offer multi-player options, high score boards and chat rooms. Playing against other people makes simple games instantly more challenging, while other games offer a lower level of interaction and opportunity to socialize.

To appeal to more players, provide opportunities to compete, cooperate, communicate, and otherwise connect with other players. These social systems can be integrated into game play. For some, reducing the challenge provides an excuse for social interaction so that players can talk with each other during game play. People play what their friends play. If you don't provide social systems players will make their own. For example, in *InkLink,* player answer bubbles are used to encourage, discourage, and otherwise talk to other players. Sometimes this communication dominates the game.

Conclusion: 17 game design principles for Internet games

In researching successful games we have observed the following principles:

1. Easy to Learn, Lifetime to Master
2. Simple obvious controls and rules that are easy to master
3. Allow players to discover controls and goals through simple exploration.
4. Provide clear, immediate, and meaningful feedback.
5. Offer clear and obvious short term and long term goals.
6. Players should be able to succeed in the first 10 minutes or earlier.
7. Support short session times of 10-15 minutes as well as longer.
8. Offer consistent controls and labels.

9. Vary the type of challenges so play does not become routine.

10. Support multiple player styles such as Bartle's 4 types: Achievers, Explorers, Socializers, and Player Killers.[29]

11. Offer more than a high score as a reward, make gameplay intrinsically rewarding.

12. Offer community/social features such as high score boards, in-game chat, and message boards.

13. Use audio feedback and sound effects to increase excitement and make interaction more real.

14. Include the option to turn audio off, so games can be played anywhere.

15. Test all aspects of the Player's experience with real users.

16. Adjust spacing between play and reward to keep players motivated and to imply progress.

17. Remember a player's high score at least between consecutive games, allow them to save it, or otherwise show player progress between games.

M. *Conclusion*

Developers of web and downloadable games face a unique set of production constraints, most of which grow out of financial and technical limitations. However, these constraints can be embraced by the optimistic developer and used to guide a more focused development process. This focus is also the first step towards managing the risks associated with development for this market. Though the budgets are small compared to console and PC titles, the risks are still significant for the small developer and require continual vigilance and creative management solutions.

Game design for the casual market demands a great sensitivity towards the less-experienced user and a tremendous respect for the player's time. The simple fact that players can try-before-they-buy means that those first few seconds of the game experience are critical. However, while their level of initial commitment may be low, casual players also have few preconceptions about gaming genres and conventions. There is still plenty of room for innovative core game mechanics that build on these players' experience. Choice of thematic content is critical and has the promise to hold player's attention while they are gently introduced to new game mechanics.

Ultimately, players' equity in the game experience should be the goal for any developer and at some level, all of the production and design considerations discussed above feed into that goal.

[29] http://www.brandeis.edu/pubs/jove/HTML/v1/bartle.html

V. Technology Overview

A. *Topology*

From a technical point of view, online games can be classified according to four main characteristics: delivery model, architecture, playing mode (number of players), and network protocol.

1. Delivery Model

The delivery model can be defined as the way players reach the game. Depending on the game, the players usually download a program and then install it, or directly play the game through their browser, most likely through an embedded plug-in of some kind. Following is a brief review of the most commonly used delivery models.

a) Web Browser Games

Web browser games are arguably the simplest form of online game (from the user's point of view). Most are developed using common plugins such as Flash, Shockwave, or Java, while some games are developed on the server using PHP or other server-side programming and execute directly in the browser with no need for a separate download and installation. Additionally, other middle-ware technologies such as those from Groove Alliance, Virtools, and WildTangent are starting to gain traction in the market as a means of quickly producing professional-looking content within a browser window.

For all plugins there are substantial issues with regards to browser security and integrity in taking the browser approach. For example, it is very difficult, if not impossible, to save files locally on the user's machine (with the exception of "cookies"); there are currently very few technologies that support full screen play (other than maximizing the browser window on the desktop); and it is unlikely that the developer will be able to block out other applications on the user's machine. In spite of these limitations, users flock to browser-based games largely because of their ease of use: at worst they have to install a plug-in, and at best they simply have to click on a hyperlink to begin playing.

b) Downloadable Games

Downloadable games execute directly on a particular native platform, most commonly Windows XP, Win 9X, or Macintosh OS X. Generally speaking, developers will package all files necessary for execution into a Windows and/or Macintosh installer. Users download and execute the installer appropriate for their operating system and then run the game from their desktop. It is common for developers to release both web and downloadable versions of the same game, using the web version to generate awareness and advertising revenue and the downloadable version to generate consumer sales. When the web version is developed for Flash or Shockwave, that same technology can be used for the downloadable version. However, many downloadable games are built in a more "traditional" environment using languages such as C/C++, etc.

The downloadable game process for casual games on the PC (and Mac) looks like this:[30]

- A player discovers the availability of a downloadable game either by direct online marketing (email, banner ad, portal site placement, etc.) or by advertisement from within the "web version" of the download game.
- The player downloads the game installer to his or her computer.
- The player executes the game installer, clicking through a series of dialogs.
- The player launches the installed game, generally via a desktop icon. The installed game is generally 'locked' in some way to restrict play ("cripple-ware") and encourage the player to purchase the 'full version' of the game. During the early phase of this phenomenon, this meant limiting game features. Recently this has shifted towards limiting minutes of game play (*e.g.* ten executions, twenty game starts, two hours of game play).

[30] IGDA Online Games Committee White Paper 2003

- The game presents an 'upsell screen' communicating the limitations and instructing the player how to 'unlock' the game.
- To unlock, players typically click a button to visit the distributor's web site, where they may complete a secure form using a credit card to purchase an unlock 'key'.
- The key is delivered via email and/or displayed on a webpage.
- The player copies the key from the email message and pastes it into the game, or has it read automatically from the clipboard when the game is started.
- The game is now forever unlocked.

c) Downloadable Clients with Web-Based Services

It should be noted that even in the downloadable games described above, it is now possible, and often appealing, to use network services in conjunction with the downloaded client. This is often done for customer support interaction, but is also used for things like high-score lists, brag sheets, player forum links, etc. Even though the game itself exists locked on the client and the network is not a part of the game play, the net is still used to provide experiences that are perceived valuable in relation to the game. This is increasingly the model of choice for downloadable games, as it allows the developer a way to contact the player for a variety of reasons, such as further upsells, game upgrades, tournament announcements, and so forth.

2. Architecture

Game architecture is defined as the structure and organization of the game software. This section will briefly describe three possible architectures for online games, client-server architecture, peer-to-peer, and standalone games.

a) Client / Server

In a client-server system, each player sends packets to other users via a server.[31] Packets are received by the users via the same server. However, servers slow down the exchange of messages in an online game. Despite being likely bottlenecks, servers do have multiple purposes. First, servers can reduce message traffic to individual users by not sending packets to those users if the packet in question is out of the area of interest of the potential packet recipient. Second, servers can compress multiple packets into a single message, eliminating redundant and unnecessary message flow. Third, servers can also convert packet bursts into smoother packet rates, thus delivering packets at a slower rate than they are generated by the individual users. Servers can also be configured to communicate with their user clients reliably. Finally, client-server architectures are also preferred if there is an administrative or control task that must be performed, such as accounting for time spent in the game on an individual basis.

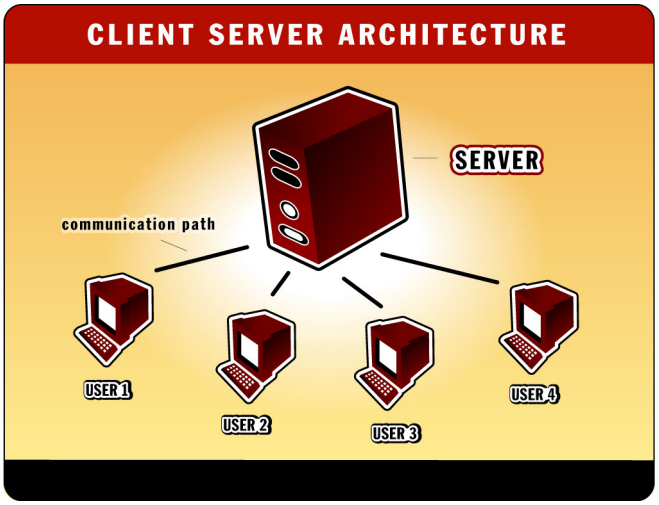
When an online game relies on a client-server architecture, the server is responsible for receiving input commands from each client, updating the game state, and sending out updates to the concerned clients. The server's biggest job is keeping track of entities such as avatars, monsters, rockets, score, etc. The server must calculate when a player is hit; use physics models to calculate the position of moving objects; turn key presses into jumps or weapons fires, etc. The server also informs clients of world state: gravity, lighting, and map information. Aside from its role in gameplay, the server is a session manager that starts and ends games, accepts client connections, and performs numerous other administrative tasks.

The client usually sends simple avatar control commands to the server. It then uses its cache of the game state, plus dead-reckoning and any updates from the server, to render a representation of the avatar's area of interest of the virtual world. The graphic rendering is performed on the client side. The client has long been the main area of interest in the game developer community because it is where all the graphics are generated. However, in a client/server model, from an architectural point of

[31] J. Snyers d'Attenhoven *Management of Networked Virtual Environments,* Free University of Brussels, Belgium, 2002

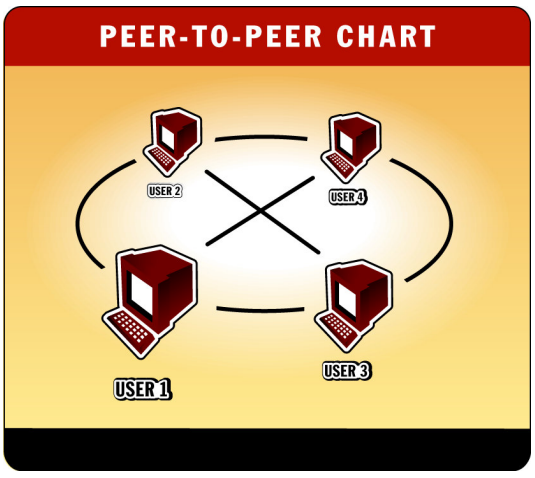
view, the client is relatively simple compared to the server. Security-wise, the client is the most easily compromised part of the chain, and should never be trusted for game-crucial calculations.

It is also worth noting that the client/server model can be very expensive to maintain, both for the cost of the hardware required, and the continual upkeep. Stand-alone games with their "ship 'em and forget 'em" style require much less overhead.



b) Peer-to-peer

In peer-to-peer architecture[32][33], we have a set of equal nodes connected by a network. Since no node is more important than the others, they must all be connected to each other. There is no intermediary and each node broadcasts (or multicasts when possible) its messages to every node in the network. Peer-to-peer means that communications go directly from the sending user to the receiving user(s) without going through a central server. Peer-to-peer is widely used for some types of multi-player computer games such as first person shooters, as it is easy to realize and to expand from a single player game. However, it does not scale up easily due to the lack of hierarchical structure. It is useful when the number of participants is small or they already communicate in a LAN environment.



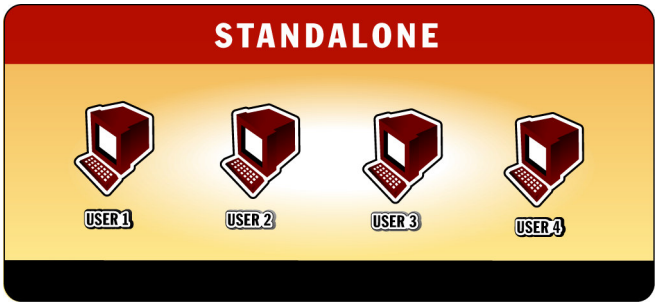
[32] S. Singhal, M. Zyda. *Networked Virtual Environments - Design and Implementation.* Addison Wesley, 1999

[33] J. Smed, T. Kaukoranta, H. Hakonen. *Aspects of Networking in Multiplayer Computer Games*. In Virtual Reality Annual International Symposium, 2001.

Among the disadvantages of the peer-to-peer architecture, is its inadequacy to provide control to the game administrators. All nodes being equal, none of them has a control on the entire simulation, providing greater opportunities for hacking and cheating.

c) Standalone

A stand-alone game is a game that once installed is capable of operating without reliance on external networks or machines. As they do not rely on connectivity, stand-alone games are often single-player games or require multiple players to use the same computer simultaneously. Traditionally, stand-alone online games are written in all software programming environments, including C/C++, Java, Flash, Shockwave, Visual Basic, and others. C# is also becoming a small player in the market.



3. Network Protocols

A connection or network protocol describes the set of rules that two applications use to communicate with each other. There are thousands of different network protocols in use, incorporating a wide set of uses, ranging from downloading documents to exchanging real-time audio and video. Furthermore, when two applications communicate with each other, they will most likely use several protocols simultaneously. This section discusses the common protocols broadly used in networked online games.

As described previously, stand-alone games do not require any network protocol while played, and generally use Internet standards such as HTTP or FTP in order to be downloaded. Rather, network protocols apply to client-server or peer-to-peer architectures, and to single-session and persistent-state worlds.

a) Internet Protocols

(1) IP

Most computers on the internet today use the Internet Protocol (IP) to communicate with each other. IP is a low-level protocol used by routers and hosts to ensure the packets travel from the source host to the destination host[34]. IP hides the transmission path and the recipient host has no way to know what hardware is on the transmission path, such as phone lines, LAN, satellite links, etc. IP splits the packets into small fragments when they traverse network links that cannot support large packets, and reassembles the packets at the other end. Finally, the IP header also includes a “Time-To-Live” (TTL) field that specifies how many network hops may transfer the packet before the packet is discarded. This prevents packets from being accidentally routed in infinite loops around the Internet.

Applications generally never use IP directly. Instead, they use one of the protocols that are written on top of IP. These higher-layer protocols include services for acknowledgements and retransmission, or support for application port numbers.

(2) TCP/IP

The Transmission Control Protocol (TCP) is the most used protocol on the Internet today. It is usually layered on top of the IP and referred to as TCP/IP. This protocol provides the running application with the illusion of a simple point-to-point connection to another application running on

[34] S. Singhal, M. Zyda. *Networked Virtual Environments - Design and Implementation.* Addison Wesley, 1999

a separate computer. Each endpoint can consider a TCP/IP connection as a bi-directional reliable stream of bytes between the source and the destination[35].

TCP/IP is reliable as it automatically transmits acknowledgements and retransmits data. Furthermore, TCP/IP verifies the integrity of received data using a data checksum contained in the data packet header and both endpoints use a data flow control technique to ensure that the sender does not transmit data packets to the network faster than the network can support or than the recipient can process. TCP/IP even allows the application to detect when the other endpoint disconnected.

Unfortunately, such reliability comes with a cost. TCP/IP must transmit more information in order to do such things as accurately describe the data ordering, detect corruption using checksums, and transmit acknowledgement or retransmission packets. Moreover, the recipient must receive and accept the entire data stream in the order that the sender transmitted it. Therefore, the TCP protocol may arbitrarily hold or buffer transmitted data in order to preserve the packet ordering. Consequently, TCP/IP is not suitable for applications that do not necessarily need a strict ordering and consistency.

(3) UDP

The User Datagram Protocol (UDP) is a lightweight communication protocol differing from TCP in three respects: connectionless transmission, best-efforts delivery, and packet-based data semantics. UDP does not establish peer-to-peer connections as the sender and recipient of UDP data do not keep any information about the state of the communication session between them. With UDP, data is sent on a packet-by-packet basis. While TCP used such information to detect packet loss, request retransmission or dynamically adjust the data transfer rate, UDP simply provides best-efforts delivery, without attempting to guarantee that data is delivered reliably or in order. In addition, the datagrams must not be too big, as this will require fragmentation, and some fragments can be lost in transit.

While UDP might appear at first as too weak to be useful, it has several major advantages. The first one is its extreme simplicity. As UDP packets do not contain any of the information guaranteeing reliability such as is used in TCP, they require considerably less processing for both the sender and the recipient. Also, UDP does not maintain the illusion of a data stream. This implies that packets can be transmitted as soon as they are sent by the application instead of having to wait in line behind other data streams. Similarly, data can be delivered to the application as soon as it arrives at the recipient host instead of waiting in line behind missing data. Thirdly and finally, as many operating systems impose limits on how many simultaneous TCP/IP connection they can support, UDP/IP seems logically more appropriate for large-scale distributed systems where each host can communicate with many destinations simultaneously.

There is however one aspect of UDP/IP that can make it rather unsuitable for some environments. When a socket is receiving data on a UDP port, it will receive packets sent to that port by any host, whether participating with that application or not. This can become a security problem for applications that do not distinguish between expected and unexpected packets. For this reason, some ISPs still block UDP packets, or block UDP in particular port ranges. While this is generally less of an issue than it was a few years ago, any large deployment should still check with major ISPs for UDP support and port ranges.

b) Flash Communication Server

The Flash Communication Server from Macromedia allows Flash and Director developers to implement multi-user solutions for clients. As well as standard data transfer, it includes the facilities for multi-way video and data, offering a rich out of the box solution for content developers. The latest 1.5 MX release added HTTP tunneling functionality and Linux server support.

[35] J. Snyers d'Attenhoven *Management of Networked Virtual Environments* Free University of Brussels, Belgium, 2002

While Macromedia's focus for promoting the Flash Communication Server is through its ability to handle audio and video streams, its ability to send standard data packets makes it a viable server solution for multi-player gaming.

c) Shockwave Multi-User Server

Since Director MX, the Shockwave Multi User Server (SMUS) has been officially deprecated as Macromedia focuses on the Flash Communications Server. However, a number of Director multi-user game developers still use SMUS for a number of reasons, including the fact that it supports features not available in the Flash Communications Server, including the ability to implement peer to peer networking capabilities, and UDP packet transfer.

For developers not interested in using the Flash Communication Server for Director/Shockwave projects, another option may be the Nebulae Multi User Server from Tabuleiro, which replicates the functionality of the SMUS in a fully supported Java environment.

B. *Base Delivery Technologies*

1. Flash

Of plug-in technologies, Flash has the largest installed base, reaching over 95% of web surfers[36]. Its core engine is primarily a vector based drawing system, combined with an ECMA based scripting language called ActionScript. The ActionScript language, like any scripting language, can be slow at times even when compared to the performance of other script languages such as Lingo or Java. For developers who want to get the most performance out of Flash, a number of disassemblers are available to allow developers to see exactly what is happening with their scripts, and this knowledge can be used to optimize playback.

For many developers, especially those concerned about users needing to install additional software and plug-ins, Flash will be the best option; due to its near ubiquity across platforms.

2. Director / Shockwave / Shockwave 3D

Shockwave continues to be one of the leading technologies for web and downloadable games. Its ability to handle fast bitmap blitting operations has given it the performance edge over Flash for certain genres of games, and with the introduction of a real-time 3D engine and Havok physics, it has a huge potential for developing small, fun 3D games. Additionally, Director developers have the advantage of being able to create a Shockwave web demo version of the game, as well as a standalone projector version of the same game within the same development environment.

Director is cross-platform, and can be used to develop content for PC, OSX and Mac OS9. The Intel-developed 3D engine for Shockwave includes a range of both standard and advanced features such as level of detail, sub-division surfaces, skinning, multi-texturing, and particle systems. Developers can create and deform meshes at run-time, or can use content from all major modeling packages using the available exporter plugins which exist for 3D Studio Max, Maya, Lightwave, SoftImage, TruSpace and more. The engine supports Direct3D and OpenGL, with a software renderer available as a fallback for systems without hardware acceleration.

The real-time physics capabilities offered by Havok provide a subset of their full v1.x package. The freely available Xtra offers support for rigidBodies, springs, and linear and angular dashpots.

3. Java / Java WebStart

Java began life with the promise of 'write once, run anywhere'. While this has been achieved more so with Java than with any other comparable, contemporary language, it has yet to become the panacea once envisioned. On the other hand, Java is definitely a viable and practical platform. Java was originally developed to serve as a portable platform for content delivery on interactive set-top boxes. The media group within Sun found themselves grappling with an explosion of portability, compiler, library, and

[36] http://www.macromedia.com/software/player_census/flashplayer/tech_breakdown.html

security issues as they attempted to develop atop a variety of commercial hardware platforms, and they invented Java to soothe the pain.

The real commercial emergence of Java was as an embedded environment in browsers for the delivery of interactive content. The portability and security features of Java made it the ideal choice for embedding in browsers that needed to execute unknown content in a secure 'sandbox'. However, inconsistent implementation of the Java environment across competing browser products defeated the original 'write once, run anywhere' promise.

Since those early days, Java has evolved considerably. Java 2 was launched as a successor to the original Java and comes in three 'editions', each one tailored for a specific class of problems. The original Java has gone on to become Java 2 Standard Edition (J2SE), a Java platform targeting a desktop environment. The Java 2 Enterprise Edition (J2EE) has emerged as a superset of the J2SE intended for deployment in enterprise and server-oriented environments. Finally, Java 2 Micro Edition (J2ME) has emerged as a slimmed-down Java platform for resource-limited devices that still might benefit from the Java platform. This paper will cover the J2SE platform as it is the most relevant to web and downloadable game development.

Java 2 Standard Edition[37] is the desktop edition of the Java platform. It provides an extensive array of class libraries and is available on a wide variety of platforms including Windows, Macintosh, and various UNIX based OS's.

It is worth quickly pointing out the differences between the J2SE Software Developer's Kit (SDK) and the J2SE Java Runtime Environment (JRE). The SDK is the software developer kit that includes the compiler and tools necessary for Java development. These are the tools developers will need to author games in Java. The JRE, on the other hand, provides the necessary tools to run Java-based applications. This is the platform clients will need to run Java-based titles.

a) Core Capabilities

Java as a programming language is an object-oriented language that many find easier to develop in, compared to C and C++. It has automatic garbage collection and a rich bundled class library that helps in handling many programming problems inherent in game development. Java also includes high-level support for network programming and multithreading.

The basic platform contains a powerful framework for developing portable user interfaces including support for pluggable UIs. Included are user interface elements designed to mimic the appearance of the various environments to which Java has been ported. The underlying Abstract Windowing Toolkit (AWT) provides the low-level support for windowing system and user interface capabilities while the layered Java Foundation Classes (JFC) provide the high-level pluggable UI componentry.

J2SE includes the Java 2D API[38] for advanced 2D graphics. This is an API for 2D game programming and includes a vast array of features for implementing 2D games. Java 2D supports both windowed and full-screen modes.

J2SE also includes the Java I/O System for communication with different sources: files, the console, network connections, etc. Utilizing the I/O library, Java can be used to design and implement a multitude of game architectures: from standalone application games to peer-to-peer multi-player games, and finally even large client/server games.

b) Extending Java

Java provides a standard mechanism for platform extension via native code called Java Native Interface (JNI). This makes it practical to use Java as a scripting language while leveraging any existing libraries and allowing developers the ability to implement more performance-oriented operations in native code.

In particular, the Java 3D API[39] is one such extension that provides advanced 3D APIs built atop OpenGL and Direct3D. While this extension is available only on a limited number of platforms, it is a

[37] http://java.sun.com/j2se/
[38] http://java.sun.com/products/java-media/2D/
[39] http://java.sun.com/products/java-media/3D/

strong candidate for mid-tier 3D game development in competition with other environments such as Shockwave3D. Until Java 3D becomes a core component of the Java platform, however, it is necessary to ensure that customers install the Java 3D extensions alongside any Java 3D-based games.

c) Java Delivery Mechanisms

A variety of delivery mechanisms exist for packaging and delivering Java-based content to your audience. These include:

- Applets
- The Java Plug-in
- Java Web-start
- Prepackaged applications (with and without the JRE)

Many commercial and open-source browsers include built-in support for Java content in the form of applets. Unfortunately, these platforms tend to support earlier Java specifications and are inconsistent and often buggy in their implementations. This makes this platform unstable and largely unsuitable for the production deployment of games.

The Java Plug-in[40] from Sun gets around this problem by providing a plug-in for these modern browser platforms that allows applets embedded in web pages to be executed using a locally installed Java 2 JRE. The Java Plug-in software forces the browser to use Sun's Java 2 JRE instead of its default Java virtual machine. The Java Plug-in therefore provides a suitable platform for deploying game content via web pages but leaves developers in the position of requiring the JRE to be installed on client desktops. The current JRE download weighs in at almost 8 MBs. However, once installed, the player may play any Java games and will only have to download the content of the games they wish to play.

Java Web Start[41] is a similar technology from Sun that is also bundled with the Java 2 JRE. Web Start is similar to the Java Plug-in in that its purpose is to allow Java content accessed via the web to run in a controlled Java 2 environment independent of the browser platform. It enables application launching by clicking on a Web page link. For example, if the game program is not present on the end-user's computer, Java Web Start automatically downloads all necessary files and then caches them on the computer to ensure that the application may be relaunched at anytime. Web Start-initiated Java applications run in their own virtual machine sandbox and are not bound to the originating web page as applets are. As such, the browser may be closed once the application has started. Web Start provides support for managing downloaded applications locally and is a strong tool for deploying games where the JRE download is not perceived to be too much of a barrier.

Another option for delivering Java applications is to use one of the many commercial and open source tools for packaging a Java application as a native platform installer. These installer tools even permit developers to include the JRE in the installation process, making for a simpler and improved user experience.

d) Additional Java Gaming Links

- Micro Java Network - www.microjava.com
- Java Gaming - www.javagaming.org
- Midlet.org – www.midlet.org

4. Wild Tangent

WildTangent[42] is a plug-in framework that is programmable in a variety of languages. It consists of a high level API for Java, JavaScript, and other COM enabled languages such as C, C++ and Visual Basic, and

[40] http://java.sun.com/products/plugin/
[41] http://java.sun.com/products/javawebstart/
[42] http://www.wildtangent.com/

has a powerful graphical engine underneath. The API provides 2D/3D support by layering on top of the Direct3D graphics API from Microsoft. Installation of the plug-in is largely transparent to the user, and there is an active updater to ensure that clients have the latest version. Access to advanced 3D through the WildTangent interface is a key feature of development in this platform, given that web-based 3D is impossible to deliver without the use of some kind of downloadable engine or plug-in architecture. WildTangent is not cross-platform, and requires users to have Windows 98 or newer.

The WildTangent engine is a descendant of the Genesis3D engine[43] which is still available under open source licensing agreements. The core Genesis3D engine does not contain the capability to play in a web browser, but can be a great starting point in creating a downloadable 3D game.

5. Virtools

Virtools[44] is another emerging technology for web-based 3D gaming. Virtools recently released the latest version of their development environment, Virtools Dev 3.0. The Virtools environment allows developers to develop their games by creating "objects" in external programs such as Max or Maya and then assigning different "behaviors" that control the way the objects interact with each other and the world. Many behaviors are pre-built, and new ones can be either compiled from C++, written in the proprietary Virtools Scripting Language, or created as a combination of other existing behaviors.

A multi-user server and the Havok engine are both available from Virtools to extend the power of the product. Some developers may also be interested to know that Virtools is available as a rapid prototyping tool for the xbox.

There is a client available for Windows and Mac based machines. One advantage to Virtools is that it supports DirectX 9 and the associated Vertex and Pixel shaders through HLSL, which is something that competing technologies do not.

6. Python / PyGame

Python is most often thought of in game development circles as a scripting language, as something that controls a lower level C/C++ core. Python in particular has been used in a number of recent projects including ToonTown (Disney), Eve Online (CCP), Blade of Darkness (CodeMasters), Star Trek Bridge Commander (Totally Games), and Earth & Beyond (Electronic Arts).[45] [46]

A new generation of games is springing up using Python in combination with PyOpenGL and/or PyGame[47]. PyOpenGL provides a wrapper to the standard OpenGL library and is thus suitable for developing 3D games, PyGame provides a wrapper to the Simple DirectMedia Layer[48] which uses GL or DirectX depending on platform, and provides cross-platform access to hardware-accelerated graphics as well as input devices and other common game-engine requirements.

Libraries exist for Python to do its own networking, and there are now several small downloadable client-server games built with Python/PyGame, with more being released every day. While most game designers are still looking at Python as a scripting language, its ease of use, cross-platform capability, and ability to call C/C++ code when needed, make it an ideal language for small downloadable games. There are currently no known technologies that play Python games natively in a browser.

7. PHP + HTML

The Hypertext pre-processor language (PHP[49]) is a widely used general-purpose scripting language that is especially suited for Web development and can be embedded into HTML. It features a simple C/C++

[43] http://www.genesis3d.com/
[44] http://www.virtools.com/
[45] http://www.gamasutra.com/features/ 20020821/dawson_pfv.htm
[46] Riley, Sean. Game Programming with Python. Game Development Series. Charles River Media, 2003, Massachusetts. pp. 1-5.
[47] http://www.pygame.org/
[48] http://www.libsdl.org/index.php
[49] http://www.php.net/

style syntax that initially only proposed structured code, but that now supports object-oriented mechanisms. PHP excels at its ease of use in building low to complex systems. PHP is completely free with many modules available for most popular Web servers and platforms.

PHP is primarily designed for server-side scripting, therefore it can do anything that a CGI script can do, from collecting data to generating dynamic page content. The difference between PHP and other scripting languages like JavaScript is that PHP is executed on the server hosting the file. As such, the client only receives the results from this script, without any access to the code that generated the result.

PHP can also be used for command line scripting. This type of usage is ideal for scripts regularly executed using Cron or Task Scheduler. PHP can also be used in client-side GUI application as it can indifferently output HTML, dynamically generated images and graphics, or even Flash movies generated on the fly. One of the strongest and most useful features in PHP is its support for a wide range of databases, from MySQL, PostgreSQL, or even Oracle to ODBC.

PHP is often selected to create small to medium online persistent multi-player role-playing and/or strategy games, most likely due to its cost, and the fact that it is a solution which allows the implementation of a client-server architecture relying on a database system. These games can be played directly through a client browser or through a downloaded client.

8. DarkBasic

DarkBasic has gained a small following over the years primarily as a first programming language, but one that is very capable of producing interesting and exciting content. The libraries included with the product allow access to DirectX and provide what amounts to a fully functioning 3D engine. Projects produced with DarkBasic cannot run native in a web browser, but must be downloaded to a client's machine and installed. The engine is currently targeted towards creating stand-alone 2D and 3D games, and does not have pre-built tools for networking capability. Nevertheless, the graphical capabilities are quite well documented and easily employed.

C. *Security & Cheating*

As web and downloadable games have become a serious business, security and measures to counter cheating have increasingly become important. Where once a cheater simply boosted a high score, hacked games with "friends", or disrupted game play, now these activities cost customers and have a very real impact on revenue. This section will focus on developing a common framework for discussion of the issues, categorizing solutions, and introducing early solutions.

Security is a large discipline that spans the entire lifecycle of a product or project and includes both technical and non-technical aspects. This discussion will briefly review the standard IT security technologies that are relevant to online games, but will focus on those that are unique to this field.

Security is intimately tied to the operational integrity of an online game. While computer games were once products, in many cases, online games today are services. This changes the essential nature of the business as customer service, retention, and acquisition depend more on persistent quality than on flashy packaging and cool graphics. Development and delivery of a game is not the end, it is just the beginning.

The security threat for traditional computer games used to be copy protection. Various proprietary schemes have been created, with each one a balance of protecting sales versus annoying customers. Typically, providing the least hassles to consumers has won out over security techniques. Just as with other traditional software, the belief was that a satisfied thief today may be a good, paying customer tomorrow. The effectiveness of the available anti-copying techniques also was, and still is, an issue.

Building Security Into Single Player Games

Written by Ben Widhelm, CTO TrafficMarketplace (Formerly CTO of the Flipside Network)

Security, as explained by data consultant and author Bruce Schneier, is a process, a series of trade-offs designed to make the compromise of a system more expensive and time consuming than the value of the asset protected by the system. The axiom holds true for game security; the

ideal solution is one that maintains the greatest level of accessibility for legitimate game play while identifying, responding to, and learning about the greatest number of attacks.

The trade-off becomes even more acute when discussing networked games. In designing a secure gaming system for skill-based competitions on iWin.com, Flipside's engineering team deployed three distinct countermeasures: a solid encryption scheme, a protocol for verifying game clients, and a control-response loop.

To secure the network pipe and prevent a man-in-the-middle attack, Flipside integrated a symmetric encryption component for all client-server communication. Utilizing this algorithm-independent component achieved their goals both in terms of accessibility (the speed of encryption and decryption) and security (symmetric encryption is a well tested method and a standard of conventional cryptography). This was a seemingly ideal scenario. Unfortunately, the work was not complete. Because symmetric encryption requires that the sender and receiver share the same key, the crucial element in the relationship is the secure delivery of that key. To accomplish this, Flipside designed a proprietary Public Key Infrastructure (PKI) handshake to deliver a (reasonably) randomly produced, single-use symmetric key. The combination of both technologies provided the best of both worlds: the security of PKI and the efficacy of symmetric encryption.

However, the team quickly realized that the most secure encryption scheme was worthless if not combined with a plan to verify and secure the game clients themselves. The ready availability and ease of use of decompilers led the company to believe that the most secure way to mitigate attacks on the game clients was to utilize a Zero Knowledge Protocol, or ZKP. By relegating the client to display layer code only, ZKPs allow a developer to protect the game and scoring logic within a server side component to be delivered dynamically at run time. While using ZKP served the security goal well, the latency inevitably introduced by such high network traffic made fluid game play impossible for all users but those with the fastest connections. In this case, the security system (ZKP) mitigated certain types of attacks very well, but at the cost of the operation of the games. The solution was to go with a hybrid approach: allow inclusion of scoring logic into the clients to streamline game play, and replicate it with a server side component that could verify scoring behavior versus its own version of the logic. Additionally, Flipside employed a method referred to as the bouncing pebble theory (unrelated to Oxford's pebble theory). This entailed taking an outwardly meaningless stream of game data, such as an event related to a pebble bouncing on the side of the road in a racing game, and verifying it along with the scoring events. We found that the inclusion of this "red herring" was often overlooked by reverse engineers.

Finally, the most effective security solution is one that is ongoing, a perpetual work in progress. Actively identifying and testing different types of attacks and corresponding new countermeasures will generally provide more security than a sedentary system. At the same time, all new countermeasures need to meet the same criteria: mitigate risks (hacks) against the asset (your game) without creating additional holes, and maintaining access for the approved users (players). No security system is perfect, but one that recognizes its shortcomings and balances the trade-offs outlined above will go a long way in achieving the ultimate goal: the confidence of your players.

1. Types of Attacks

From a technology perspective, it is useful to divide attacks on online games into three major categories: hacking, cheating and griefing. These distinctions serve to allow us to separate traditional computer security countermeasures from those that are unique to online games.

Unfortunately, the number of specific attacks is virtually limitless. Also unfortunately, many stem from sloppy development and business practices. Buffer overflows and out-of-range errors are the product of poor programming. The traditional software development community has this problem and has not addressed it for the past thirty plus years and the game development community is no better or worse.

Similarly, it doesn't matter if a developer uses Secure Sockets Layer (SSL) to encrypt credit card numbers if they leave them in the open and unencrypted on public servers. Good development and operational practices will go a long way towards addressing security problems.

a) Hacking

Hacker attacks are classic attacks on operating systems, networks, and standard applications, such as databases. These methods of attack may be used to affect the behavior of a game (such as editing the game code binary on a server), but at their core, they are traditional vulnerabilities that can be countered by traditional security tools and disciplines. This does not mean they are any less important, but the game security community has its own unique problems to deal with.

Anti-piracy and digital rights management tools are not unique to the online game business, but the issue is sufficiently relevant that the game security community does need to develop its own expertise and solutions. Fortunately, digital rights management and anti-piracy measures for games are sometimes simpler than for video and music in that interaction and community are a part of the experience, a situation that game rights tools can use to their benefit.

b) Cheating

Cheating attacks the game itself. Examples include: alterations of software and data to reward the cheater and penalize others; tools to extract or discover unauthorized information; timing attacks to favorably manipulate online game play; and any thing or method that breaks the rules of the game. The category of "aim-bots", or software that automatically aims for a player, is particularly interesting. Just as card counting is strongly discouraged in Blackjack, tools that help optimize players' actions are considered cheating, even if they don't otherwise break the rules. Also, as with card counting, some form of observation and modeling is required to attempt to separate highly skillful play from augmented performance. The suspicion of cheating by players can cause a serious problem for an online game. Even worse is the possibility of cheating by the game site operator.

c) Griefing

Beating the system can, unfortunately, be done legally. Games are inherently social activities and the systems that implement them assume norms of behavior. Abusive language, improper conduct, and other nastiness in online games get a disproportionate amount of publicity and have a dampening effect on the entire industry. Griefers are individuals who, using the relative anonymity of online play, are actually not playing a game, but using the game as a mechanism for satisfying other, darker, purposes (causing grief to other players). Technical solutions are of limited value. Monitoring and other forms of adult supervision are the most effective, and unfortunately, very expensive countermeasure. Griefers can even use anti-griefing systems to disrupt games by generating sufficient complaints against a targeted innocent player to get them identified as a griefer.

2. Common Exploits

In the following sections, we will review the most common methods used in online cheating, and the protections against them.[50] [51] [52]

a) Packet & Traffic Tampering

In online games, three classic ways to cheat are *reflex augmentation*, *packet interception*, and *packet replay*. Reflex augmentation consists of replacing or enhancing the player skills and response with an automated input. Using proxies or traffic monitoring, the cheater sends additional packets on the network with the effect of, for example, increasing their firepower. Reversely, in packet interception, the cheater prevents packets containing information that could damage their character from arriving, thus becoming invulnerable. In a packet replay attack, the same packet is sent repeatedly, such as to increase the cheater's firing rate.

---

[50] M. Pritchard. *Cheating in Multiplayer on-line Games.* The 2001 Game Developer Conference Proceedings, San Jose, California, 2001

[51] J. Smed, T. Kaukoranta, H. Hakonen. *Aspects of Networking in Multiplayer Computer Games*. In Virtual Reality Annual International Symposium, 2001.

[52] http://dark.swcombine.com/documentation/pdf/SWC-SO-v1_0.zip

The common method used for breaking the control protocol is to change bytes in a packet and observe the effects. To prevent this, game designers can use checksums in their packets. Unfortunately, cheaters could also crack the checksum algorithm. Additionally, adding a checksum increases the traffic, wasting precious bandwidth.

By using encryption on the command packets, cheaters have less of a chance to decode the game protocol. However, two packets containing the same information will have to be different or the encryption code will be inefficient against packet replay attacks. Efficient encrypting algorithms slightly increase the required computational power of both the source and destination hosts.

These kinds of attacks generally happen in peer-to-peer games where a player's client is the final arbitrator of any aspect of the game. In client-server architectures, the game's administrator can keep control of the game by forcing the clients to communicate only action requests and not action results, and constantly verifying the full state of the simulation. Unfortunately, this method requires significant computational power from the server and forces the designers to add checking procedures in all game code.

b) Information Exposure

Information exposure means the revealing of any game information hidden from the player. Using cracked client software, the cheaters can base their game decision on more accurate knowledge than they are supposed to have. Examples of this are replacing textures with transparent ones, allowing a cheater to see through walls in first-person shooter games or removing the fog of war in strategy games.

Once again, an obvious solution is to choose a client-server architecture where the server once again checks for the feasibility of issued commands. A similar protection exists in peer-to-peer architectures: every node has to check the validity of each other's command, and if cheating is detected, the nodes vote if the spotted node should be barred from the game.

c) Bugs, Loopholes & Design Defects

Often, game designers do not need to wait for game cracks to be released before having to fight cheaters. If there is an exploitable loophole or bug, cheaters will find it, exploit it, and some time will pass before the game administrators will be alerted of the bug. The only solution to this kind of problem is to be extremely vigilant for any problem to arise and then to issues patches until all bugs are fixed. Ideally a server patch will allow developers to immediately remove the bug for all users.

3. Solutions

Given attacks from hackers, cheaters, and griefers, there is a range of solutions available. There are seven categories of technical solutions to online game security threats. Five of these categories address game-specific security issues while traditional IT security solutions and non-technical solutions range across the entire gamut of attacks.

Security Solution Category	Countered Attacks
Traditional IT Security	Hackers
Game Monitoring	Griefers, Cheaters
Game Software Security Tools	Cheaters
Game Protocol Security Tools	Cheaters, Griefers
Digital Rights Management	Hackers
Game Design	Cheaters
Non-Technical Solutions	Varies

As noted above, good development and testing practices will have a substantial impact on security. Business processes and other operational systems are also critical.

a) Traditional IT Security Solutions

There is a vast range of traditional information security technologies and solutions, virtually all of which are applicable to online games throughout their lifecycle, from development, through to sales

and support. Everything from simple anti-virus and firewalls, to encryption and digital signatures, and even elaborate high-reliability/high-availability systems should be considered for an online game service. Also, supporting policies, such as audits, access management, privilege separation, disaster recovery and contingency planning, as well as general security awareness, are part of any complete security solution.

Certain standard IT security tools may be integrated into an online game's design and development. Cryptographic techniques and access management tools are two sets of tools that are often relevant. However, they do need to be implemented with care to meet the developer's intended objectives.

(1) Security Scenario 1: Traffic Spoofing

Network packets are an easy and obvious target for attack in online games. They are available outside the game software and there are numerous tools to intercept, modify and generate IP packets. Alteration and packet replay are two common spoofing attacks.

While many developers have created proprietary and convoluted methods to obfuscate game data in network packets, experience has shown that cheaters and hackers will spend the time and trouble to reverse engineer the data design.

Encryption is often not enough. Due to concerns about maintaining network synchronization, packets may need to be processed even if received out of order, and often bandwidth is precious. Additive encryption or simple scrambling schemes can be subject to analysis and the underlying data can be altered without breaking the cryptography. Also, because of these concerns about keeping the cryptography and data in synch, replay attacks can often be let right through strong, unbroken cryptography.

Digital signatures are powerful tools for maintaining the integrity of data packets. Unfortunately, they are often computationally intensive. When non-cryptographic checksums are used instead, they can often be easily analyzed and circumvented.

b) Game Monitoring

Game monitoring has benefits beyond security. Support for spectators in many online games has helped broaden their appeal both as a marketing tool for spurring sales and simply as an end in itself. Tools like HLTV provide this service.

From a security perspective, game monitoring helps visually identify anomalous behavior. Location jumps, impossible attacks, and other actions that should not be possible can be observed. Recording these actions in a log can be used to generate a record that can be used to handle disputes.

Game monitoring tools must have two additional features to truly act as a security feature. First, the logs and data used to generate the logs must be non-repudiatable. This means that the game players must have credibly generated the logs, and that the logs cannot have been subsequently altered. The second requirement for such a secure logging system is that its data cannot be used to favor one player over the others or otherwise affect game play. This can be more of a challenge in that the information, while it is being recorded, may include material that specific players are not supposed to know at that time, for example, a football game where the defensive team can see the play being called by the offense.

c) Game Software Security Tools

There are a number of game software security tools. These products attempt to detect and counter cheating software by various strategies. Typically, they are built for client/server games where the server is assumed to be trustworthy. Some current products in this area include HLGuard, Cheating-Death, and Punkbuster.

The server portions of such solutions look for anomalous network traffic that corresponds to various cheating packages. This is very similar to conventional Intrusion Detection Systems (IDS) that have a catalog of signatures that they continuously search for. This catalog is continually updated with new "cheat signatures". The server may also use heuristics to attempt to detect new forms of cheating. Some of these server tools probe the client-side player platforms to determine if the corresponding client security software is in-place and operating properly. The server may also support a registry service for good and bad players.

The client portion of these solutions also is looking for cheating software. The security client software faces a particularly daunting task as the player typically willingly, if not eagerly, has installed the malicious code. These solutions work similarly to anti-virus software by looking for cheating software signatures. They may also work in a more intimate fashion with the game to make certain types of cheats impossible (Cheating-Death relocates the local position of illegitimate targets to a point where they cannot be attacked).

Makers of these security tools are in a continual “arms race” with the cheating community. Cheaters will reverse engineer and circumvent each version of security code and the toolmakers must continually work to keep up.

d) Game Protocol Security Tools

By their nature, online games can be attacked both within the local software and on the network connection between players or between a player client and the game server. Encryption and digital signatures can prevent manipulation of game data and against disclosure. This can be very effective against third parties but, as noted above, may be less effective against a malicious player client.

A different approach is to secure the game transaction between the players. The SecurePlay library does this by implementing game transactions in a manner that is mutually suspicious. This approach means that the participants in the game do not need to trust the other player's software – as long as the transaction is valid, the game is valid. These basic transactions can be combined together to implement the various game rules and provide overall game integrity. The advantage of this approach is that the online game can be secured entirely through the network transactions between the players or the server without requiring any trust in the remote party.

e) Game Integrity Tools

Game Integrity is simply whether the game that is being played is being played in conformance with an agreed upon set of rules. There are two types of game integrity: state integrity, verifying whether the current game state is valid; and rule or transition integrity, verifying whether the transition between one state and the next conforms to the rules of the game. Because many online games have rules and state information that cannot be known while the game is being played, some means must be used to verify the complete game at its end as well as game transactions and activities as they occur, where possible. Card games offer the most familiar example of this situation. First, a card deal must be implemented fairly. Second, the card play must conform to the rules of the game which can, mostly, be verified as it occurs. And finally, the deal and location of all cards throughout game play can be confirmed at the end of the game since disclosure will no longer affect game play.

A game verification engine can either take two sequential game states and validate them against the game rules, or can confirm that individual game rules transactions are permitted under the rules of the game, given a specific game state.

f) Game Design

Even game design and rules themselves can positively affect security. Careful game design can eliminate entire categories of threats, such as making targeting and attacks rules-driven rather than by “pixel pointing”. Network performance is often the biggest enemy of good game security. The need to preposition player and adversary information where it should not be known to allow smooth network play creates a real challenge, particularly for low speed players.

(1) Security Scenario 2: Unauthorized Information Exposure

Unauthorized information exposure is the disclosure of any game information that should be unknown to a given player. This can only occur if game state information is pre-positioned on the player’s computer. The information is supposed to be unknown to the player, but typically is known to their software.

Using cracked client software, cheaters can extract this information and make decisions based on their illegal superior knowledge – thus gaining an unfair advantage.

There are two standard approaches to this problem. The first is a pure client/server architecture where no information is available on the client prior to its availability to the player. This

architecture is naturally secure against this, and a number of other malicious client threats. The other option is to pre-position the necessary information, but provide it only in encrypted form. The server would then send the decryption key at the time that the client needs the information.

As noted above, the first approach may require more processing power and network capacity than is acceptable. The second approach does reduce the network congestion problem, somewhat, but the processing time associated with encryption and decryption may be unacceptable. Also, pre-positioning encrypted data may by itself signal that something has happened, and therefore clue in the potential cheater. Empty encrypted packages can work in this case, but once again, additional bandwidth and processing are being added to the system.

Once again, an obvious solution is to choose a client-server architecture where the server checks for the feasibility of issued commands. A similar protection exists in peer-to-peer architectures: every node has to check the validity of each other's command, and if cheating is detected, the nodes vote if the spotted node should be barred from the game.

4. Non Technological Solutions

There are a number of non-technical solutions to security problems in online games. GameMasters and good customer service are valuable, regardless. They can also be an effective tool to deter cheating. Unfortunately, additional staffing can be very expensive relative to software. Finally, registries of good and bad players and other reputation tools can be effective low-tech tools to manage cheating in certain circumstances, though they should be carefully considered based on the player types. For example, a public registry of "bad" players may incentivize some individuals to exhibit bad behavior just so they can get their name on the list!

VI. Online Publishers

A. *Publishers in the Online Market*

The inescapable truth in the game industry is that game offerings on mainstream platforms do not go to market without the involvement of a publisher. As the game industry has matured, the model of how games are developed, marketed and distributed has evolved to a well-known system of defined retail channels and formalized processes between product makers and product sellers. With game industry revenues continuing to grow, the method for getting product into the channel has crystallized to the point of an over-abundance of new content attempting to be evaluated for market worthiness with a fixed amount of slots available for presentation to the consumer.

The emergence of the Internet has served to change this landscape to nearly eliminate the barriers to entry for game products to be made available to consumers. This however is not a one-for-one comparison among channels. The Internet distribution model, while growing, is still orders of magnitude behind the profitability and reliability of the traditional distribution channels. There is much consensus in the market that the gap between these two will shrink, but at what point in the future this will happen is unknown. As this channel continues to mature, the parallels to the retail channel continue to grow and the existence of publishers able to get products into the channel is strengthening to the point that product makers are gravitating towards those organizations that can act as product development collaborators, marketing vehicles, and distribution partners. The ability for anyone to throw up a website and start selling games is an option that is always present. However, the efficiency of getting a product in front of as many people as possible with the added values of conducting transactions, providing customer support to consumers, and generating significant marketing and exposure, leads to the understanding that downloadable and web-based game publishers are valuable allies to involve in this category of game product delivery.

To accurately present the state of publishing in this growing market, many of today's leading online publishers were interviewed for this section of the paper to present an aggregate input on the current state of the business, trends on which direction the market will go, and what factors are important for success.

B. *Web-based Publishers*

Web-browser based games made their mark early in the Internet media era by leveraging the visibility of popular websites to present entertainment offerings to eager surfers. The lure of millions of eyeballs playing casual games with advertising content sprinkled about the experience was seen as a sure thing for hungry promoters. This formula grew into many variations of potential profit-making forms centered on the fact that a browser could be used as easily for offering online games as viewing a website. While the business models flourished and floundered in various forms, the attention to the game play and game offerings was constant, and more sophisticated offerings were developed as the technology matured and the development experience became more polished. Game offerings grew to become more compelling to consumers because they actually passed as playable content. This even grew into the offering of mainstream content from earlier consumer platforms into nearly identical web-based versions. From this, various websites solidified themselves as established destinations providing this form of entertainment. Today there is a consolidated version of top-tier web destinations both stand-alone and linked to larger Internet Media companies, that have fine-tuned the presentation of web-based games to offer variety and quality to demanding consumers, while continually figuring out how to get them to open their wallets to pay for the privilege.

C. *Downloadable Games*

Not far behind the browser-based games was the re-emergence of another game product meant to appeal to the online customer. Advanced development languages targeted to exploit the web content delivery model became available to offer content to consumers regardless of their computer platform or location. These development languages challenged developers to express their creativity and flex their engineering muscles to create game products at the quality level of what consumers were used to, while educating them on the new experience of playing in new environments. Furthermore, the constriction of

data delivery rates presented an additional element of challenge to developers. It required the creation of products that would not be hampered by slow data rates, since they would diminish the interest of a casual consumer looking for a quick moment of entertainment.

Some of these products succeeded, and the experience of playing smaller games became more comfortable to consumers. Ultimately the development technology circled back to include the traditional development tools that developers were accustomed to with mainstream platforms. What evolved were the small file-size games that were easier to develop, cheaper to make, and that appealed to the needs of consumers who were looking for a simpler gaming experience without a sacrifice in quality.

D. *The Downloadable / Web-based game Publisher Role*

Defining what a downloadable and web-based game publisher exactly is presents a large challenge because the structure of this business is still evolving. When considering the role of a publisher in a traditional retail model with a mainstream development platform, the services rendered by a publisher include many or all of the following: funding, development collaboration, business planning, product packaging, marketing, distribution and customer service. Since the Internet-based model lowers barriers to game creation that were caused by the complexity of some of these facets, a publisher in this space does not always offer this domain of services. In fact some organizations classified as publishers offer a small number of services that may be simplified to the role of distribution. This however is one of the unique aspects of this market segment – much of the heavy lifting has been simplified because of the enormous power the Internet has given individuals in terms of being able to reach out to the entire world with the use of a single personal computer.

Calling an entity a publisher in this space may be a loose definition, but in the effort to identify those groups that help develop, promote and distribute this category of product to the marketplace, performing one, any or all of the requisite services of a publisher is sufficient. As to the objectives of the developer, getting one's product out to the marketplace is the principal goal of any development effort, so a partner that can provide some or all aspects of the services of a publisher, whether it be a 10-person organization or a department in a gigantic Internet media company, the results can be equally successful.

How RealArcade's producers & developers work together

Written by Garrett Link, edited by David Nixon

Each week many new games are submitted for consideration for distribution through RealArcade. These games come from novice and experienced developers alike. Each is subject to a rigorous review process to help us ensure we choose the top quality games with a high potential for success. A few games arrive completely finished, polished, and designed for online try-before-you-buy style consumption. Others are pretty clearly off the mark. The middle, representing the majority of games, require some amount of work on the part of the development team in conjunction with a RealArcade Producer to optimize the success of the game in this specialized channel.

Here are the core areas in which Real Networks provides the most feedback to the developer:

Is the core gameplay intuitive?

Is the UI well organized, easy to navigate, and properly factored to draw the user to important functionality and actions?

Does the game have adequate audio and visual production value?

Is the game play well balanced with a difficulty and complexity curve suited to the RealOneArcade audience?

Does the game provide optimal feature mix and depth to maximize appeal?

Combo Chaos received close attention from the RealArcade Producer assigned to the project. The game's potential was obvious at first play, when the Producer sat down, took control of the mouse, and clicked on one tile to reveal a star and another to reveal a clover. Within seconds the Producer made his first match and in less than a minute fully grasped core game play. The game had two key elements, compelling core gameplay, and immediately understandable basic mechanics. *Combo Chaos* also already served as an example of elegant simplicity of user interface design. The user can completely navigate the UI and play the game with only the mouse. There was (and is) only one main menu screen with 3 simple options: Play, Options, and Quit.

However, though the audio and visuals were coming along nicely, making use of gender-neutral colors and elements that were soothing to the eyes, it was missing sensual pizzazz. So the head of the development team and the Producer discussed the importance of visual pop and snap and specific ideas for providing the player a sense of exhilaration through the audio/visual design.

In the way of gameplay, the Producer focused his feedback on three areas where *Combo Chaos* could improve the most – learning curve, gameplay pace, and game controls. At the time of initial review, *Combo Chaos* required the player to make matches consistently as the only way to succeed in the game. This caused some concern. Too much requirement for the player to remember accurately might reduce the fun and steepen the learning curve. The Producer also had some concern at the sheer amount of clicking normal gameplay required, and asked the developer to experiment with alternative control designs to reduce this frantic clicking to a more manageable pace.

Armed with this feedback and some ideas, the game development team implemented creative and effective improvements to address these initial concerns with great success. Proper difficulty balance and gameplay pace was achieved by carefully weighing the number of different images that could appear on the tiles, and by adding new images at a well-measured pace as the player progressed. Power-ups were introduced to alleviate some of the stress of having to make a match every time. A particularly brilliant special tile reveals all the tiles for a short period of time so the player can click directly on the images and rack up big points if used strategically.

To create mounting excitement as the player succeeds, and encourage learning, the game team did a fantastic job of linking audio and visual effects to player actions. As a player creates longer and longer combos, the voice-over tells you that you're doing better and better. The background music is in the background where it belongs, but subtly keeps the player in the pace of the game.

Combo Chaos released on RealArcade in late June 2003, immediately leapt to the #1 spot in the top 10, and stayed in the top 10 for several weeks. It continues to sell successfully today.

E. *Publishing Process*

With the compressed development requirements, more open publishing environment, and nascent stage of this market, the effort to get a game into the channel is more straightforward and accessible to developers.

According to publishers, the consensus is that there is a strong demand for these sorts of products in the market, and that the pursuit to find games that are appealing to consumers and will generate sales is ongoing. The managers of these web destinations that account for the vast majority of users seeking these products, maintain an ongoing vigil of assessing the product mix they are offering to assure the blend and quality of meets the demands of consumers. From straightforward sales volumes to comprehensive assessments of conversion percentages and download bandwidth consumption, publishers need to make sure they are presenting the games that maximize sales and minimize resource use.

In conjunction with the ongoing assessment of existing product mix, most publishers employ a standardized evaluation program to evaluate new games which have been given to them by eager and aspiring developers for consideration of publishing. The process is fundamentally common among the players, consisting of a submission mechanism, usually via e-mail, with commensurate explanations of evaluation and communication policies between the parties. Depending on the company, the amount of new submissions can number from 3 to 20 per week. Once a game is received, each publisher assesses the merit of a game with their own mix of criteria and product portfolio objectives. Evaluations can be focused on the universal criteria such as "fun factor", addictiveness, and replayability; individual objectives such as a game's play style match to a destination's unique customer demographic; or requirements for rounding out a particular product category. Upon passing initial evaluation requirements, a game will then be considered for release based on the publisher's available distribution slots, revenue forecast, and staffing support.

The process has matured to a form such as this out of necessity to maximize revenue potential amidst a sea of offerings, but also has an inherent X-factor that can shift the normal evaluation criteria. Judgment calls can determine the presentation of a game. If a particular title is selling consistently with high conversion rates it may be kept in premium product placement positions to maintain revenue streams despite a new title that shows a tremendous amount of promise. Suffice it to say there is no certain pattern, and that publishers' efforts are dynamic and require constant attention to keep up with ever changing consumer demands.

F. *Trends and Forecasts and Critical Success Factors*

According to the publisher community, the outlook for the ongoing performance of this market segment is positive. With inherent factors such as low cost product development, abundant supply of new products, low overhead for product distribution, and strong communication capabilities with the consumer, most publishers feel there is room for continued growth in this space.

There are many factors which lead publishers to feel that the market is going to continue to grow and increase revenue generation, making it worth growing product offerings. These factors include: consumer acceptance of purchasing online, increased Internet connectivity, and better understood consumer characteristics.

With the bounty of lessons learned from the Internet media business attempts of the past, the publishers in this space regard certain factors of product design and consumer behavior as critical to try and create success. No one formula is for certain and it is impossible to predict the needs of all consumers, but in the face of uncertainty, best efforts are made to identify patterns and traits to mitigate risk and create the best effort possible for success:

1. Game Charactistics

1. Addictiveness
2. Fun factor
3. Challenge
4. Replayability
5. Low learning curve
6. Multiple game play forms for variety
7. A well-designed demo that gives a taste of the game and intrigues users to want to find out more about additional features available.
8. A web-based version of the downloadable game to create additional interest and exposure for the downloadable version.

2. Business Acumen

1. Know the customer. Define who the target market is for the game, understand what their needs are for this game, and satisfy those needs better than anyone else.

2. Acknowledge that this is a business. To be in this industry in a money-making capacity, developers have to manage their efforts in this manner.

3. Understand the marketplace. All the parties that developers are involved with have an objective in being in this space. Know what they are doing and what their objectives are and work towards that.

4. Understand the technologies. There are various platforms and tools available to create a product in this space. The final offering and the form it is in should be designed to accommodate the business value chain and facilitate the customer transaction.

5. Conversion rate from try to buy is one of the most important criteria in judging the success of a game and its longevity in the market.

3. Industry Trends

1. Sales transactions with the consumer are more desirable than ad-based revenue. Downloadable games present a more attractive model than web-based games.

2. Publishers look at the independent development community as a robust source of new content development. Opportunity is strong for developers to get product into the market.

3. The number of developers in this space has grown tremendously. New product availability has grown significantly.

4. Room for distribution channels is not unlimited. Certain destinations will support the mass market, others will target niche markets. Visibility and branding, or attentiveness to customer needs is what will make certain destinations persevere.

5. The need to innovate is constant. With a significant supply of product available there is a high barrier to standing out from everyone else. Though there are definite advantages in associating with a brand and producing high profile sequels, in general "me-too" copycat games have a limited success prospect and excessive sequels of that type have a diminishing return.

6. Shelf space is being more closely managed. Publishers know they have to create the proper mix of products to appeal to their customers and this means being very selective on what and how much is presented to consumers.

G. *Publisher Directory*

The downloadable and web game market is most mature in the United States with respect to consumer acceptance and business operations. While online gaming enjoys a very healthy revenue picture in countries outside of the U.S., the aspects that are accounting for this success are attributed to the more mainstream full PC games and their online models.

U.S. based publishers state that Europe and SE Asia present appealing markets to expand their businesses into, but at this time only modest efforts by a few competitors have been made as they wait for the understanding of the market to become clearer. Open issues such as online payment methods in Europe and concerns of piracy in SE Asia are attributed as the reasons for the reserved forays into these markets.

The main publishers for downloadable and web games in the U.S. have varying policies on how they handle new game submissions from developers. These vary from direct contact information on the

publisher's website explaining how to submit a prospective game, to the acceptance of industry or professional references only.

The following is a list of publishers from the principal markets discussed in this paper. It is intended to present the organizations in the U.S. that account for the majority of commercial downloadable and web-based game business (starting with an alphabetical list of the "Big 5"), followed by representative organizations from international markets. General contact information is included to be utilized as a starting point for contacting a company with a game submission proposal. Specific information on how to submit a game (if applicable) can usually be found on the publisher's website. If no information or policy is offered, this information can at least be used to identify potential publishing partners that developers may want to seek out via an industry network such as the IGDA or at a professional event such as the GDC. *(Note: this list is for informational purposes only. It does not offer any assurances that communication or business dealings with the companies presented will be accepted or supported by these companies.)*

1. United States

Pogo.com
Electronic Arts Inc.
209 Redwood Shores Pkwy.
Redwood City, CA 94065-1175
http://www.pogo.com

RealOne Arcade
RealNetworks, Inc.
2601 Elliott Ave., Ste. 1000
Seattle, WA 98121
http://www.realonearcade.com

Shockwave.com
AtomShockwave Corp.
114 Sansome Street, 10th Floor
San Francisco, CA 94104
http://www.shockwave.com

Yahoo! Games
Yahoo! Inc.
701 1st Ave.
Sunnyvale, CA 94089
http://games.yahoo.com

Zone.com – MSN Games
Microsoft Corporation
1 Microsoft Way
Redmond, WA 98052-6399
http://zone.msn.com

AOL Games
America Online Inc
22000 AOL Way
Dulles, VA 20166
Keyword Games
703-265-1000

Arkadium
Arkadium, Inc.
650 5th Avenue - 31st Floor
New York, NY 10019
http://www.arkadium.com

Big Fish Games
Big Fish Games
2100 Westlake Avenue North, Suite 102
Seattle, WA 98109
http://bigfishgames.com

CandyStand.com
KF Holdings
http://www.candystand.com

GameHouse
GameHouse, Inc.
100 South King Street, Suite 620
Seattle, WA 98104
http://www.gamehouse.com

Magic Bunny – Skunk Studios
Skunk Studios, Inc.
http://www.magicbunny.com

Playsite
Next Game
25 2nd St, Suite 201
San Francisco, CA 94102
http://www.playsite.com

PopCap Games
PopCap Games, Inc.
2401 4th Ave, Suite 810
Seattle, WA 98121.
http://www.popcap.com

Skill Arcade
CYOP Systems International Inc
1286 Homer Street Suite 300
Vancouver BC V6B 2Y5
http://www.skillarcade.com

SkillJam
eUniverse, Inc.
6060 Center Drive, Suite 300
Los Angeles, CA 90045
http://www.skilljam.com

TryGames
Trymedia Systems
1516 Folsom Street
San Francisco, CA 94103
http://www.trygames.com

Wild Tangent
18578 NE 67th Court
Building 5, Redmond East Office Complex
Redmond, WA 98052
http://www.wildtangent.com

WorldWinner
275 Grove
Auburndale, MA 02466
http://www.worldwinner.com

2. Europe/ SE Asia

Boonty
European Headquarters - PARIS
147 -149 rue Saint-Honoré
75001 Paris
France
http://www.boonty.com/

OneWorld BDC
5151 Collins Avenue, Suite 326
Miami Beach, Florida 33140
http://www.oneworldbdc.com/

Scandinavian Games
Scandinavian Games AB
Nobelvägen 80
212 15 Malmö – Sweden
http://www.scandinaviangames.com

VII. Contributor Background

A. *IGDA Online Games SIG Steering Committee*

1. IGDA Online Games SIG Chair

John Welch

John Welch is responsible for acquiring and developing games and other interactive entertainment for the Shockwave.com brand. He is also responsible for the technical infrastructure of the company and its three web sites: atomfilms.com, shockwave.com, and gameblast.com. He has been with Shockwave.com since 1999. Prior to Shockwave.com, John spent time at Sega and with a consulting company that he co-founded. He holds Bachelor's and Master's degrees in Computer Science, the former from MIT and the latter from the University of Massachusetts. John is driven by the purpose of raising online gaming to greater mass-market appeal and commercial success, demonstrated by his involvement with the IGDA, GDC, E3, and other industry groups and events. He can be contacted at john@shockwave.com and john@twofish.com.

2. IGDA Online Games SIG Assistant-Chair

Jeferson Valadares

Jeferson Valadares is Creative Director and co-founder of Jynx Playware, a 12-person, 3-year-old game development company. He's also on the organizing committee of the Brazilian Workshop on Games and Digital Entertainment (WJogos) and on the Technical Consultative Advisory Board of the Game Design and Planning Graduation Course at the Universidade Anhembi Morumbi, Brazil. A B.S. and M.Sc. graduate, he does research on Artificial Intelligence applied to Computer Games. Amazingly, he STILL manages to come up with time for his favorite non-gaming related activity: reading.

3. IGDA Online Games SIG Chairperson Emeritus

Alex Jarett

Alex Jarett is Chairman Emeritus of the International Game Developers Association (IGDA) and is the founder and Chairman of the IGDA's Online Games SIG. He is the President and founder of the Technology Executives Club (http://www.technologyexecutivesclub.com/), the Midwest's largest professional education and networking association for technology and ebusiness executives. Alex also formed the Broadband Entertainment Group, Ltd., a business development company specializing in online and digital entertainment. The first project for the group is the development of an online game developer for the mass-market audience. Prior, Alex was Vice President and co-founder of Real Sports, LLC, where he successfully developed relationships with major publishers such as GT Interactive, ABC Sports Interactive/Disney Interactive, Ubisoft, Hasbro, Infogrames and Microsoft, and major licensors such as IMS and Games Workshop. Alex has 22 years of business development and marketing management experience in the software and new technologies markets. He can be reached at: ajarett@technologyexecutivesclub.com or jarart@msn.com.

4. IGDA Online Games SIG Steering Committee Members

Brian Robbins

Brian Robbins is a Senior Creative Technologist for Fuel Industries, a developer of web applications and games. He is responsible for the design and development of most Fuel gaming projects. Prior to joining Fuel he worked with Worlds Apart Productions developing The Lord of the Rings Online Trading Card Game, and at CleverMedia where he created over 70 Shockwave and Flash games. Brian has presented at numerous industry conferences including GDC, WebDevCon, Macromedia UCON, and the upcoming FlashInTheCan and Mobile and Games Forum. He is very involved in the game development community, contributing to the Online Games White Paper every year since its inception, as well as helping run the Colorado and now Ottawa IGDA chapters. He has a BS in Computer Science, and an MBA from the University of Denver. He can be reached at brobbins@fuelindustries.com.

Greg Mills

Greg Mills, Senior Business Development Manager, AOL Games. He is currently responsible for the casual business and content strategy for the AOL Games group. In addition, he is responsible for all industry and competitor analysis in the online gaming industry for AOL. Before joining AOL, Greg worked at WorldPlay Entertainment and at The 3DO Company in a variety of marketing and business development positions. Greg earned his M.B.A. from Santa Clara University and a B.A. in Economics from Pomona College.

Elonka Dunin

Elonka Dunin is General Manager of Online Community at Simutronics Corporation (www.play.net), where she has been working since 1990. Simutronics has some of the longest-running games on the internet. The award-winning *CyberStrike* opened in 1993, *DragonRealms* has been running continuously since 1996, and *GemStone* opened in 1989! Also an amateur cryptographer, she has won considerable acclaim with the cracking of "uncrackable" codes, and is currently helping out with the war on terrorism by teaching government agents about cryptography and what types of codes that Al Qaeda may be using. Elonka is a longtime member of the IGDA and has been attending the Game Developers Conference for more years than she can remember. For contact information, please see http://www.elonka.com .

Jon Estanislao

Jon Estanislao is responsible for business development activities at Activision in the wireless, online/broadband, and interactive television gaming industries. Formerly, he was a strategy manager in the Communications, Media and Entertainment Industry practice of Accenture LLP. He specialized in the interactive entertainment industry and assisted clients, including console manufacturers and software publishers, with online strategies, competitive analysis, market entry, financial analysis, and customer registration. Jon has also been a speaker at interactive entertainment industry events, including GDC 2003. Jon has an MBA from the Anderson School at the University of California, Los Angeles (UCLA), a BS in Business Administration from Georgetown University, and a CPA in the State of California. He can be contacted at jestanislao@activision.com.

Jennifer MacLean

Jen's responsibilities as Director, Sports, Entertainment, and Games at Comcast include product and business development for the country's largest high-speed internet provider, focusing on interactive products and services that showcase the benefits of a broadband connection.

Jen has had a long and varied career in game development, specializing in online content. After beginning her career at Microprose Software, she joined AOL in 1996 as a Product Manager in the Games Channel; during her tenure at AOL, she held numerous positions in the AOL brand programming division, including Programming Director for the Games Channel.

Jen is a frequent speaker at interactive entertainment industry events, and has earned a BA in International Relations from the Johns Hopkins University and an MBA with a concentration in International Business from the Columbia Business School. Jen resides in Valley Forge, Pennsylvania, with her husband.

Jen can be contacted at jennifer_MacLean@cable.comcast.com.

Dave Rohrl

Dave Rohrl has been producing and designing video games for more than 7 years, delivering more than two dozen titles. Since joining Pogo.com in 2000 (and EA Online in 2001), Dave has spearheaded many of Pogo’s most popular online games, including Word Whomp, Tumble Bees, Hammerhead Pool, and Payday Freecell, and has worked to develop new partnerships and business for EA Online. Previously, Dave worked at The Learning Company, where he led design and development on 10 PC and Mac titles. In previous incarnations, Dave also worked in senior roles in QA and Tech Support. Dave has been a game addict since age 8, when a neighbor gave him a copy of Avalon Hill’s D-Day at a garage sale, and is actively involved in multiple German-style boardgaming groups.

B. *Market Overview*

Derrick Morton (Section Editor)

Derrick has been creating and marketing entertainment software since 1994. He spent 3 years at Graphix Zone, ultimately as Vice President of Development, publishers of the Wheel of Fortune and Jeopardy! CD-ROM Games among many others. In 1997 he joined Cimarron/Bacon/O'Brien, a top entertainment marketing design house in Los Angeles. At CBO he was the Senior Producer of a group which developed over 100 interactive projects servicing all of the major motion picture studios. In January 2000 he joined a startup called iWin.com, a online game site which was eventually purchased by Vivendi Universal and renamed Flipside. He served as the Vice President, Product for the company until February 2003 when he joined GameHouse as Vice President, Marketing. At GameHouse Derrick heads up game marketing, GameHouse.com and GameHouse's Wireless and Handheld business. He holds a BA in Cinema-Television Production from the University of Southern California with Magna Cum Laude honors and is currently completing the Executive MBA program at UCLA.

David Kennerly

David Kennerly developed five massive multiplayer online games (MMOGs) in the US and Korea. He has held titles of producer, game designer, community relations, and technical writer at Nexon. He designed and scripted player-driven religions, politics, creative contests, fairs, and other innovative features.

John Lee

At Turbine, John is responsible for international business development and strategy, with a principal focus on the Asia Pacific game markets. Before joining Turbine, John was involved with several new media companies in Asia as a consultant, venture capitalist and board member. Specifically, John was a Principal in Softbank Venture Capital based in Seoul, Korea and a Director of Softbank Korea, Softbank Corporation's holding company for investments in the Korean market. Prior to Softbank, John was a management consultant with McKinsey & Company and an IT architect at Deloitte & Touche.

Miguel Oliveira

Miguel Oliveira is the CEO of GameBubbles, LLC, an LA agency with offices in the US and Europe representing independent game developers worldwide. He brings more than 10 years experience in marketing and sales. After obtaining a bachelor's degree in Marketing followed by an MBA, Miguel started his career with Marketing & Sales management positions in the automotive and aviation industry. In 2000 he joined the dot.com gaming arena as COO of Phenomedia USA, Inc. before founding his own company, GameBubbles, LLC in 2002.

C. *Business Models*

Mark Warner (Section Editor)

Mark W. Warner is the founder, CEO and President of Nexus Entertainment. He has a Bachelors degree in Finance from California State University, an MBA from the University of Phoenix in Finance, and a certificate in Investor Relations from University of California at Irvine. He has over 16 years of financial, managerial, and strategic experience, 20 years of writing experience and 5 years of game design experience. He continues to work on developing Nexus Entertainment into a prominent development house as they work on their RTS game and game engine, both currently called HardPoint™, and an online game called NexusRISING™. Mark is also the lead coordinator of the Orange County chapter of the IGDA and co-chairman of the IGDA Charity committee, and a contributor and editor for several of the other IGDA White Papers.

Steven Davis

Steven Davis, CEO of IT GlobalSecure Inc., has nearly 20 years of experience developing commercial and government information security solutions. At IT GlobalSecure, Mr. Davis has led the development for the SecurePlay fairplay cryptography software to secure network games and co-created its underlying

patented technology. Mr. Davis has led IT Security programs for US DOD, FBI, FAA, US Department of Treasury, Bell Atlantic, CSC and SAIC. He has a BA in Mathematics from the University of California at Berkeley and an MA in Security Policy Studies from George Washington University.

Peter H Friedman

Peter H Friedman is the proprietor of a Certified Public Accounting firm that specializes in economic/financial and taxation consulting for businesses. He has been invited to, and attended, the annual U.S. Securities and Exchange Commission Government-Business Forums on Small Business Capital Formation since 1992. Mr. Friedman was interviewed for the magazine *Business 2.0* in regards to internet multistate taxation and was an expert witness at the ECommerce Tax Advisory Commission public forums. He contributed to the Independent Game Developers Association 2003 and 2004 Online Game White Papers on legal, tax and financial issues of wireless gaming. He has frequently lectured in front of various State Bar and CPA Societies on multistate and international tax issues of electronic commerce and the Sarbanes-Oxley Act of 2002. He lectured in December 2002 on US multistate issues at the seminar entitled “Emerging Issues in Online Entertainment and Interactive Gaming Operations". He lectured at the Dragon*Con convention in Atlanta on taxation of online gaming. He will be lecturing at the 2004 GDC on compensation and employment tax issues. He is currently the Chairman of the Tax committee of the New Hampshire Society of CPA’s. Mr. Friedman is licensed to practice in the States of New Hampshire and New York, and is registered with the Public Company Accounting Oversight Board. Peter can be contacted at peter@peterfriedmancpa.com or 603-358-6666

Paul Lewis

Paul Lewis brings over 17 years of expertise in the areas of sales, marketing and information technology to MindComet Corporation, a leading interactive agency. In his role within each of these disciplines, Lewis has successfully implemented visionary systems and processes that resulted in significant gains in productivity and quality. As Senior Vice President of Sales and Marketing, Paul works with clients at all levels to ensure projects are successful from both technical and practical perspectives. Lewis has the skill and vision to decipher intricate business needs, and coordinates them with the appropriate technical and marketing solutions for a variety of MindComet's national and international clientele such as ADT, Coors, Earthlink, Maersk, Nextel and Upper Deck.

Prior to his work with MindComet, Lewis held senior sales and management positions with companies including AT&T, Netopia, Tupperware and Sprint.

David Nixon

David Nixon is a game industry veteran of 14 years, with most of the last 5 years spent exploring the business of downloadable games as a founding team member and Executive Producer for RealArcade. In his current capacity as Director of Publishing for Oberon Media, Inc. David scours the globe looking for products that extend the reach of video games deeper into mainstream culture. A die-hard fan of the creative spirit in small, independent developers, David is constantly on the lookout for new markets, new players, new developers, and unique video game experiences.

D. *Production and Design*

Wade Tinney (Section Co-Editor)

Wade Tinney is a game designer, sound designer, and a founding partner of the New York City-based game developer Large Animal (http://www.largeanimal.com). Large Animal develops original web-based, downloadable, and mobile games. They've also developed games for clients such as LEGO, Mattel, MTV, AOL/Time-Warner, and the New York Philharmonic. Wade has taught game design to both undergraduate and graduate students at Parsons School of Design, where he also earned an MFA in interactive design.

Josh Welber (Section Co-Editor)

Josh Welber is a programmer, software architect, and founding partner of Large Animal Games. He has developed both 2D and 3D game engines; server side applications (for games and tools). He has a long

and abiding interest in game AI programming. Prior to 1997 he developed digital and analog art installations, taught math and designed and built furniture. Josh holds an MFA in Design and Technology from Parsons School of Design in NYC.

Juan Gril

Juan Gril is the producer responsible for downloadable games at Yahoo! Games. He has been with Yahoo! since 2000. Juan has been involved in the past in the organization of SIGGRAPH conferences, and participated in other industry related groups. He holds a Bachelor's in Electronic Media from the University of Illinois.

Margaret Wallace

Margaret Wallace is the Co-Founder and CEO of Skunk Studios -- a San Francisco-based game development studio that focuses on creating high-quality original games that everyone can play. Before Skunk Studios, Margaret produced and designed games for Shockwave.com and Mattel's Hot Wheels brand. Margaret also collaborated on CDROM and online content for Mindscape Entertainment, SSIGames Online, RedOrb and at PF.Magic, creator of the "virtual life" series of "Petz" programs."

E. *Technology Overview*

Andy Phelps (Section Editor)

Andrew Phelps is an assistant professor at the Rochester Institute of Technology, in Rochester, NY. He is the founding faculty member of the game programming concentration within the department of information technology, and his work in games programming education has been featured in the New York Times, CNN.com, USA Today, National Public Radio, IEEE Computer, and several other articles and periodicals. He regularly publishes work exploring Web-based game engines at the Director Online User's Group (DOUG) and the Macromedia DevNet Center. He is at work on his first text with Prentice Hall, and maintains a web site at http://andysgi.rit.edu featuring his work as an educator, art-ist, programmer, and game addict. He teaches courses in multimedia programming, game engine development, 2D and 3D graphics, and information technology theory.

Mal Duffin

Mal Duffin has over 15 years experience working in the real-time 3D field, including developing Virtual Reality systems at IBM and Playstation games at Sony and Shiny Entertainment. As a director of Irish company CanDo Interactive, he now focuses on Web 3D development, including the creation of innovative marketing games, as well as product visualization for commercial sales solutions.

John-James McChesney

John-James McChesney has been involved in realizing the potential of technology for 10 years. During the last 5 years he has worked with 3rd party developers creating content and applications for mobile handset products. As a Senior Staff Engineer at Metrowerks, John-James is responsible for testing, certification and distribution; and has a particular interest in DRM and application signing technologies. John-James has a PhD in Semiconductor Technology.

Jehan Snyers d'Attenhoven

Born in Brussels (Belgium), Jehan Snyers d'Attenhoven studied Engineering at the Free University of Brussels where he wrote a thesis about the management of Networked Virtual Environments. He then joined the industry to work on embedded systems and monitoring applications for energy systems for Cherokee Europe. While his days are full of micro-controllers, field busses, and other power supply devices, his nights are devoted to online gaming and especially the Star Wars Combine development. The Combine is a free massively multiplayer online role-playing simulation game, based on the Star Wars universe, having been developed by amateurs during their spare time. Achieving this project he works on during his spare time has become an important objective. He joined the International Game Developers Association in 2003 to share his experience about web-based online games.

Steven Davis

(please see bio above in the Business Models section)

F. *Online Publishers*

Steven DeBenedictis (Section Editor)

Steven DeBenedictis works as a strategic partner with publishers and studios advising on business strategies and software development practices. He has a comprehensive background in product management and business planning with technology development and entertainment media companies. He has worked extensively in the Internet media, data networking and software development industries creating products and online services for electronic entertainment game play and distribution. He can be contacted at steve@bumpsriver.com or at www.bumpsriver.com.

James Belcher

A consultant in FIND/SVP's Technology, Information and Communications Practice, James Belcher specializes in a range of technology-related issues covering computers, wireless telecommunications and the video game industry.

Scylla Costa

Scylla Costa is one of Jynx Playware's founders and has worked as a Project Manager and Community Manager of FutSim, the first Brazilian PSW. Currently he is working as a Producer at Jynx Playware.

G. *Case Studies*

Christian Oestlien (Editor)

Christian started in Internet games in 1999 when he joined the launch team at iWin.com. At iWin he grew the company's free Internet lottery service, eXtremeLotto, into a multi-million dollar product. He later ran the Product Development group at Vivendi Universal's Flipside Network and successfully created multiple premium services for the company, including the relaunch of the iWin.com website as a leading skill-based games destination. Most recently Christian was Director of Product Development at WorldWinner, where he was responsible for the company's tournament infrastructure and content partnerships with leading developers including GameHouse and FreshGames. Christian is also a co-founder of TrafficMarketplace, a leader in performance-based online marketing. He will be attending business school in the fall of 2004.

Nicole Lazzaro

Nicole Lazzaro, President, XEODesign,® Inc., creates compelling Player Experiences for mass market entertainment. For 14 years she has consulted on best selling titles for Ubisoft, Sony, Leap Frog, Maxis, Mattel, Broderbund, and Roxio. She is also the co-founder of San Francisco State's Multimedia Studies program and studied Psychology at Stanford University.

Garrett Link

Garrett works at Real Networks.

John Lee

(please see bio above in the Market Overview section)

Steve Meretzky

Steve has been designing games since 1982. He was a game author at adventure game pioneer Infocom throughout the 80's, where some of his titles included Planetfall, Leather Goddesses of Phobos, Zork Zero, and The Hitchhiker's Guide to the Galaxy (in collaboration with Douglas Adams). Since then, he has

done design work for numerous companies including Disney, Hasbro, Blizzard, Activision, and THQ. He was also a founder of development studio Boffo Games, creator of Hodj 'n' Podj and The Space Bar. He is currently Principal Game Designer for WorldWinner.com, the Internet's leading provider of skill-based games in cash tournaments.

David Nixon

(please see bio above in the Business Models section)

Miguel Oliveira

(please see bio above in the Market Overview section)

Simon Oliver

Simon Oliver joined Random Media in February 2002 as creative technologist, being promoted to Head of Research and Development in 2003. He has worked on many award-winning online games and web presences for the BBC and PlayStation 2, including *Shooting Stars Krazy Golf, Ratchet and Clank*, and *Shinobi*. He was one of the speakers at the OFFF 2003 festival, for which he also created an interactive gaming installation. (simon@randommedia.co.uk)

Scott Roesch

Scott is responsible for marketing, consumer revenue, creative direction, and site management at AtomShockwave. His career in Internet media spans 10 years, the first half as an editor-producer with pioneering Web properties Mr. Showbiz and ESPN.com, and the latter half with AtomShockwave. He joined AtomFilms in 1998 as a member of the startup's small launch team, and has since served the company (which became AtomShockwave in 2001) in several capacities, including marketing, content acquisition, business development, and editorial / programming. Scott earned a BA in English from the University of Washington.

Sukhbir Sidhu

Sukhbir has worked as a producer of Internet games for several leading game websites including Total Entertainment Network, Pogo, EA.com and the Flipside Network. Since joining PopCap in June 2002 Sukhbir has worked on a variety of game projects including Rocket Mania, Tip Top, Typer Shark, Astropop, Insaniquarium and a number of upcoming titles currently in development.

Mike Vann

Mike is Vice President of Sales at YaYa Media, Inc.

VIII. Closing

We thank you once again for your interest in the 2004 Web and Downloadable Games White Paper. This paper is the result of the efforts of numerous volunteers, and it is only with their continued support that we can provide projects like this to the community.

If you would like to be involved next year, please check our website at http://www.igda.org/online/ and let us know how you can help.

Thank you!