

# Consumers, Fans, and Control: What the Games Industry can teach Hollywood about DRM

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## ABSTRACT

Through legislation and technology the film industry has been seeking to fully control usage of the bits it creates; their model is “restrictive” digital-rights management (DRM) that only allows the user to view the film rather than copy, edit, or create new content. Meanwhile, the experience that the Internet generation has of interacting with, rather than consuming, content, could be the basis for a new business for Hollywood: films that enable users to interact directly by putting themselves (and others) into the movie. In this paper we examine massive multi-player online role-playing games (MMORPGs), in which players exercise design technologies and tools that further their roles and play. MMORPGs are rapidly gaining audience share. We posit that non-restrictive, or flexible, digital-rights management is in the movie industry’s economic interest.

## Categories and Subject Descriptors

J.m [Computer Applications]: Miscellaneous

## General Terms

economics, security

## Keywords

digital rights management, economics, movies, films, games

## 1. INTRODUCTION

Once upon a time movies and games were truly different entities. In 1935, for example, the Parker Brothers game Monopoly came on the market<sup>1</sup> and the Marx brothers’ *A*

<sup>1</sup>Parker Brothers was offered Monopoly in 1934 but turned it down, whereupon its designer, Charles Darrow of Germantown, PA., marketed the game himself, to tremendous success. A year later, he returned to Parker Brothers, and this time they bought the game.

*Night at the Opera* opened. In the dark days of the Depression, they were both forms of entertainment, but there the resemblance ended. Monopoly was a game for the living room, with family or friends all participating. *A Night at the Opera* was for movie theaters; you bought a ticket, walked in, sat down, and watched the film. Aside from the pleasure of the experience, the two forms of entertainment had nothing in common.

Such distinctions are disappearing. In 1991 Brenda Laurel observed that much of the activity in computer games is actually interactive storytelling [20]. The state of rendering has improved sufficiently much that online games are within five years of being able to create characters that realistically resembles the user<sup>2</sup>. The distinction between computer games and the movies will, if not evaporate, become not much of a distinction at all. Our interest is how this convergence will affect Hollywood, specifically with respect to digital-rights management.

The combination of ability to interact with the content and increased quality of rendering presents the film industry with a serious challenge to audience share. This occurs in a context in which Hollywood is already threatened by increased Internet participation<sup>3</sup>, a cell phone culture which is itself changing the meeting and dating habits of the young [21, pp. 2-3], and changing demographics (in particular, flat movie attendance by the 12-24 age cohort and lowered attendance by the population overall). Notwithstanding Hollywood’s current success with gaming versions of select movies, MMORPGs are changing audience expectations in the U.S. and even more greatly in the Asia/Pacific region (defined as Hong Kong, Korea, Malaysia, the People’s Republic of China, Singapore, and Taiwan), with the result that users increasingly expect to be able to interact with the content that they access.

Hollywood’s reaction to audience use of digitized film has been one of control, pressing for stronger copyright laws and ironclad technological protections. In this, the recording and film industries are following a very different route than MMORPGs. In many cases, MMORPGs encourage users to play with the bits: modify the game, create new entities, and otherwise digitally interact and change the developers’ content. In some instances, users have even sold content developed using tools from the game; content that might arguably belong to the game developers, but has thus far remained under the control of the user. Supporting the de-

<sup>2</sup>Or ones that are taller, thinner, and have high cheekbones!

<sup>3</sup>Specifically, “People are watching less and reading fewer books, as a result of being online” [7].

velopment of such secondary economies is recognition of the growing market share for media that allows users to interact with the media. The movie industry needs to take a serious look at the models pioneered within the MMORPG industry; there are lessons to be learned. We believe that Hollywood should favor “optimistic” digital-rights management technology, which would open the road for the movie industry to flourish in an environment where user-created content is increasingly grabbing audience share.

## 2. ECONOMICS OF COMPUTER GAMES: WHO PAYS AND WHO OWNS WHAT

Computer games are almost as old as computers: Turing machines predate the first computerized tic-tac-toe game by only fifteen years<sup>4</sup>. But while the Turing machine was a theoretical construct, the tic-tac-toe game was a real working program.

Interesting computer games require speed, memory, and graphics capability. Thus the first computer videogame, Magnavox’s *Odyssey*, a tennis game played on a TV screen, did not arrive until 1971. Two years later, Atari created the Pong arcade game and computer gaming began to take off. The 1977 development of the Apple II with color graphics and floppy disk drive furthered that explosion. Dropping cost, increasing speed, the PC, networking, and mobility all played a role in the growth of the computer games industry.

It is rapidly growing. In the US, the video games industry surpassed ten billion dollars in 2005 [25]. Of the entire gaming population, roughly 19% are online gamers. Video-games are present in 40-50% of U.S. households and players average ten-and-a-half hours per week [12]. In the Asia/Pacific region there is essentially no console penetration; instead, computer games mean online games. The online gaming market in Asia/Pacific generated \$1.09 billion in subscription revenue in 2004, representing a 30% increase over 2003. Korea remains the biggest online gaming market in the region, followed by China. Two attributes fuel this rapid growth: Internet cafes open round the clock in the PRC and rapid broadband adoption in Korea. Gamers in Asia/Pacific spend between nine to fourteen hours a week on online games [13].

From a business-model perspective, computer games can be divided into three categories: those you purchase, those that are offered as a service (often through subscription fees), and those you purchase and then pay a value added service fee for new features (such as playing on the network). The first two types of games have well-known business models; we focus on the third type of game, MMORPGs, which provide interesting mixes of who controls what.

MMORPGs have their genesis in the 1974 *Dungeons and Dragons*, a non-computer fantasy role-playing game. Multi-User Dungeon (MUDs), non-graphical computer games, were the online follow on to *Dungeons and Dragons*, and were developed in 1978. In MUDs, the players were characters in the *Dungeon* world, similar to *Dungeons and Dragons*. The characters were not very complex and there were no computer driven players. The only characters in the game were the players themselves.

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<sup>4</sup>Turing machines were first described by Alan Turing in 1937; Tic-tac-toe was first programmed on the EDSAC in 1952 by A. S. Douglas.

The first for-profit MMORPG, online computer role-playing games in which a large number of players can interact and play against one another, came about in 1984 with *Islands of Kesmai*, a CompuServe game that users could access at \$12 an hour. Although there were not-for-profit student games available before 1984, *Islands of Kesmai* was the first commercial MMORPG. As the Internet developed, so did MMORPGs. Prior to the Internet becoming available for public use, MMORPGs were confined to online services such as AOL and CompuServe, and all players in a particular game had to subscribe to that service. In 1994, business-related uses of the Internet were permitted and MMORPGs began to appear on the public network.

The face of MMORPGs has changed dramatically in the past several years. At the beginning, MMORPGs were dominated by the fantasy genre. This type of gameplay lent itself to certain types of individuals and required large time investments. Games like *EverQuest* and *Lineage* were dominant and garnered a large population of the MMORPG community. Many people in the industry started to feel that this corner of the game market was saturated due to the overall community size stagnation.

This was not true. The problem was the type of play. These games required a large time investment to learn the game and even more time to advance in it. On average, players were playing over twenty hours a week. To grow the market, the style of gameplay had to change to accommodate players with less time to devote to the games. The first game to do so was *City of Heroes*, which allowed players to advance relatively quickly without investing too much energy in roleplaying aspects. *City of Heroes* also allowed players to jump in and out of the game as time allowed.

Most recently, a single game has changed the industry’s basic assumptions about the limits of a MMORPG. *World of Warcraft* has successfully integrated an easy-to-learn and easy-to-play game with the depth of a true role-playing game. New players can be successful quickly in the game even while players who are more traditional can explore its depth. Introduced in 2004, *World of Warcraft* has attracted approximately six million players and is largely responsible for the rapid growth in the online games market.

In the Asia/Pacific region, roughly 40% of online gamers prefer MMORPGs (in Taiwan MMORPGs are preferred by over 50% of online gamers). Internet cafes have aided in promoting such establishments as entertainment centers. In the PRC, the average gamer spends over 20 hours a week playing MMORPGs while those in the other five countries of the region spend half as much time<sup>5</sup>. An indication of the popularity of this medium in the PRC is the fact that recently the Chinese government instituted limits on the amount of time players can spend continuously on online games [3].

The online gaming market in Asia/Pacific has been growing at roughly 25% year over year since 2003. Last year’s online gaming revenue was estimated at roughly \$1.3 billion with MMORPG accounting for 38% of the total, or \$503 million [14][13]. Assuming that MMORPG maintains this level of the revenue share, we can estimate MMORPG revenue at one billion dollars by 2009. Other sources are even more optimistic [10].

There are also emerging online game markets in India, Indonesia, and Vietnam. Market research indicates that

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<sup>5</sup>The PRC government has given tax breaks to promote online gaming.

MMORPGs are popular in these emerging markets for many of the same reasons they are in Asia/Pacific [15], and, “The significance of Internet cafes in developing countries continues to be substantial as it addresses, to a certain degree, low PC penetration and ownership. The Internet cafe factor is also applicable to otherwise prohibitive broadband costs, as users can simply rely on the pay-per-use basis rather than monthly subscription packages” [15]. MMORPGs will likely continue to grow in popularity — and revenue — year after year in *all* regions of Asia.

In the US the numbers are considerably different. The economic makeup of the players — and especially the economic differences between the two regions two decades ago when console gaming (but not Internet gaming) was introduced — means that console gaming predominates. Of the online gaming taking place, roughly 9% is dedicated to MMORPGs [8, p. 10].

The technology of MMORPGs is a standard client-server model. The game is on the server; players run client software on their machines that enable them to assume their avatar’s role. The gamer interacts with fellow players and “levels up,” increasing his power and skills. Players level up in a variety of ways: through succeeding in certain tasks, such as slaying dragons (metaphorical and “real” ones), defeating enemies, acquiring new skills, and acquiring items of value (magic cloaks and the like).

There are many reasons that MMORPG players are passionately committed to their games, including the interactive nature of the online gaming world [11, p. 3]. Another is the role that players have in creating their characters and their tools. They work to make the world their own. This connection is a two-way street: MMORPGs designers rely heavily on players for the success of the game and, in particular, on users creating goods of lasting value in the games [18, p. 1]. Will Wright, developer of the popular Sims games, puts it this way, “[Y]ou give the player a tool so that *they* can create things . . . I try to keep focused on enabling the creativity of the player,” [27].

Wright calls players “conducers” — a hybrid of consumer and producer [27]. Enabling producers’ success is important to the future of a game and Ralph Koster, former lead designer of *Ultima Online* and *Star Wars Galaxies*, argues for giving producers even greater capabilities, “We can do what Lego did and give them [the players] the blocks” [18, p. 1].

Conducers have given rise to a new economy. People buy and sell avatars and tools in an out-of-game economy [31]. In 2004, an Australian game player bought a virtual island from Project Entropia for twenty-six thousand dollars [22]. The sale of virtual gear for game characters, such as weapons and clothing, is a fast growing business in China [26]. Bill Bishop, a chief executive for Chinese game developer Red Mushroom Studios suggests that, “unlike [the] U.S. consumers who may pay \$50 or more for a game, consumers in China, where software piracy is rampant, are unwilling to pay high prices for virtual gear for game character.” As a result, companies in China have had to find different and new sources of revenue from the game players. One such is selling virtual items, which has grown into a major market [26].

Edward Castronova has detailed how whole businesses have emerged [4, pp. 163-164]. BlackSnow Interactive Inc. developed high-level characters from the Mythic game, *Dark Age of Camelot*. Mythic threatened to keep these characters

out of the game, whereupon BlackSnow sued. This case was inconclusive, as it was thrown out of court because BlackSnow missed its court dates. Another company, Yantis Enterprises, bought and sold items from *EverQuest*. Yantis enabled players to deal with a broker rather than buying and selling from another player in the game. There is even a company that sells items for several games: Internet Gaming Entertainment Ltd. (IGE). Calling itself the “leading MMORPG Service Company,” IGE offers for purchase items from over a dozen games, including *Anarchy Online*, *City of Heroes*, *Dark Age of Camelot*, *Dungeons and Dragons*, *Eve Online*, *EverQuest*, *EverQuest 2*, *Guild Wars*, *Final Fantasy XI*, *Lineage 2*, *RF Online*, *Second Life*, *Star Wars Galaxies*, *Ultima Online*, *World of Warcraft US*, and *World of Warcraft EU*. IGE has offices in Los Angeles and Miami, and subsidiaries in Hong Kong. IGE is big business, dealing in multiple games and multiple currencies, both in game and out of game.

Selling assets can be a source of revenue for the game developer if the assets are offered as a service within the game (and another advantage for the developer is that this revenue can lower subscription fees). This is the model that Shanda, a Chinese publisher, is developing [9]. Otherwise, selling assets has primarily been undertaken by small businesses other than the gaming company, or by the users themselves.

Some games — *Second Life* is one such — emphatically permit an out-of-game economy to purchase in-game items [30]. “Linden Labs [creator of the virtual world *Second Life*] doesn’t mind having its currency bought and sold, and even grants *Second Life* members ownership of the intellectual property rights to whatever they create in the world,” reports the *New York Times* [30]. This out-of-game economy is part of the attraction for some players, who have gone into business based on services they provide for the game [5]. Linden estimates that in January 2006 alone, the out-of-game economy was about five million dollars — or \$38 per *Second Life* player [5]<sup>6</sup>. But while some cultures favor trading — the vast majority of Koreans, who are big game players, are an example [31] — the opinion is not universal for gamers.

From a legal standpoint, the typical situation is a player who buys software and, in accessing it, agrees to the End User License Agreement (EULA) and Rules of Conduct (ROC) that govern the use of the software. In 2000 Sony, publisher of the popular *EverQuest*, changed the EULA for *EverQuest* prohibiting players from selling their accounts or in-game items [28]. Sony made this change for a variety of reasons, including players who were unhappy with the fact that the out-of-game economy was affecting the in-game one. The company risked losing players who were dismayed by the “cheating” of players who purchased their way through the levels [11, p.p. 7-8].

While the question of whether out-of-game auctions for items developed using in-game tools represents copyright infringement is unsettled, there are, in fact, strong reasons to believe that the created works do not infringe copyright

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<sup>6</sup>While certainly some of the elements sold in *Second Life* simply go into “playing the game,” the sales are not a pyramid scheme; there are genuine applications to the “real” world and these generate income. For example, one of *Second Life*’s customers is, through a contractor, the Center for Disease Control, which is using the site to develop virtual clinics that can train emergency workers for setting up sites in a crisis [5].

when not explicitly prohibited by the game's EULA. Lewis Galoob Toys developed the tool "Game Genie," enabling a gamer to change up to three features of a Nintendo game (such as increasing the number of lives of their character, increasing the speed at which the character moved, or enabling the character to fly above obstacles). The tool functioned by blocking a single data byte sent by the Nintendo game cartridge to the CPU in the Nintendo Entertainment system and was inserted between the cartridge and the system. Nintendo sued, arguing that Game Genie was a derivative work, thus infringing on Nintendo's copyright. The court held otherwise. In *Lewis Galoob Toys v. Nintendo of America, Inc.* 964 F. 2d 965 (1992), the Court ruled that because Game Genie is an enhancement and "cannot duplicate" Nintendo's game, Game Genie was not a derivative work (and therefore not infringing of Nintendo's copyright).

This is a ruling with interesting implications for conductors. Garlick argues that under the Galoob decision, which focused on the innovation in Game Genie, "*out-of-game* auctions should survive an allegation of derivative works because . . . they do not supplant demand for the original game but instead increase demand and market for the original game" [11, p. 29].

Of course, the legal issue does not need to be fully resolved in order to argue the benefit of non-restrictive digital-rights management technologies for the movie industry. There are several lessons for Hollywood from the games world:

1. Gamers create items within the game using tools provided by the game.
2. These items have value. They increase the value of the game to *all the players* and they are part of what keeps players connected to the game.
3. Within the game, the gamers "own" these items.
4. In some games, the items created in the game may be sold in an out-of-game economy.

Regardless of whether court rulings eventually result in (4) being true for the game industry, the movie industry needs to consider (1) and (2).

### 3. FANDOM: NOT ONLY A COMPUTER GAMES PHENOMENON

At heart, gamers are fans. They form a "fan culture," communicating, participating, contributing to the game they enjoy. The contributions that they make are investments, tying them ever more tightly to the game. But gamers are just one example of ardent enthusiasts of modern media.

There are the ardent devotees of the soaps and of Oprah, but our focus is on participatory fans: fans who engage in creating media that interacts with the content. This might be fan fiction: fiction based on the characters of the content, and it might include films that are either based on the content or are, in fact, pastiches of the content mixed in new ways.

Henry Jenkins, an MIT professor who has studied fan culture for several decades, has observed, "Fans respond to [the] situation of an increasingly privatized culture by applying the traditional practices of a folk culture to mass culture, treating film or television as if it offered them raw materials for telling their own stories and resources for forging

their own communities," [17, p. 6]. This participatory culture "might well [have] start[ed] with the photocopier, which quickly became the 'people's printing press,' . . . [then] the VCR . . . to re-edit television footage," [17, p. 5]. Other tools include the camcorder, the cell phone, and the digital camera.

Participatory culture includes the Trekkies, the Star Trek fans, who wear Star Trek uniforms, hold Star Trek conventions, and create fan shows by cutting and splicing old episodes of Star Trek. So well known is their devotion that they themselves were parodied on *Saturday Night Live*. Fans of anime, Japanese animation, serve an important role in anime culture. They help the industry by subtitling episodes for distribution. They create fan fiction and develop a community; many high schools and colleges have anime clubs that show the films for free<sup>7</sup> Participatory culture includes devotees of Star Wars, who have cut and pasted the film, creating spoofs, parodies, and zines (small circulation, self-produced publications)<sup>8</sup> [17].

Members of such participatory cultures are valuable to the content creators; they are devoted conductors who create new content that draws in additional viewers. Media owners take advantage of such a base; Jenkins notes that, "Media producers are consciously building into their texts opportunities for fan elaboration and collaboration — codes to be deciphered, enigmas to be solved, loose ends to be woven together, teasers and spoilers for upcoming developments," [17, p. 9].

Fan devotion is quite impressive. Many fans spend hundreds of hours on fan fiction, parody, and making films for which they receive no form of compensation except admiration and connection to their "community." Until now the dedicated fan has been able to take what is there and weave it together to create something new, and that has been its own reward. But what higher form of participatory culture is there than for the fan to weave herself, or someone she knows, into the story? That is what nonrestrictive DRM would enable such a fan to do. This has not been the approach taken by Hollywood as it releases new films on DVD.

### 4. THE CURRENT STATE OF THE MOVIES

According to the Motion Picture Association of America, box office revenue is roughly \$9.5 billion, and has been stagnant at this level since 2002[24]; indeed, admissions trends are on a slight decline since 2002, from 1.64 billion tickets sold in 2002 to 1.54 billion in 2004. (Note that the scale of the decline is so small that it may not be significant). These numbers reflect the domestic U.S. market only; international markets for U.S. film products have been steadily increasing.

The economics of movie release are interesting. Movies are first released exclusively to theaters for approximately two weeks to four months; there are no video releases during

<sup>7</sup>Permission to do so is typically based on the fact that there is no admission charge. See <http://demaagd.com/anime/animeclubs.html> (last visited 8 March 2006), which is a site that lists Japanese anime companies willing to have their content shown free at fan clubs. The site includes whom to contact for permission for free viewings.

<sup>8</sup>The zines included sexually-explicit stories that Lucasfilms objected to. Lucasfilms did not object to other non sexually-implicit zines, thus implicitly giving those approval.

this period. Approximately 26% of the studio take on a film is generated from the box office, generally in the first two weeks (often on opening weekend). Approximately another 46% is made from the sales of videos and DVDs (including to rental stores). Then approximately 28% comes the various TV distribution types [1]. The next stage is premium pay channels such as HBO and Showtime. Note that exclusivity is misleading at the latter stages of the life-cycle. The movie is shown concurrently on both the premium cable channels and pay-per-view for approximately eighteen months, and channels pay based on the success of the film in the theater (but the average is six to eight million dollars per picture). Following this, distribution is network and cable TV, and then finally, syndicated TV, each with their own revenue stream returning money to the studio.

Restrictive DRM is the tool sought to preserve this business model. Restrictive DRM that leaves the user in the position of consumer — view, view once, view through next Thursday, or view three times — but not creator can, in the presence of trusted clients, help preserve the business model described above. But by limiting what users can do with content, the movie industry may be cutting themselves out of lucrative businesses. In the next section, we explore that issue.

## 5. WHAT ARE THE DRM IMPLICATIONS FOR HOLLYWOOD?

“Videogames and Hollywood have been colliding in slow motion for two decades” is the claim [23, p. 1]; is the collision about to happen? In fact, interactive technologies and movie special effects are growing more alike. In order to fully understand this, we need to give some background on the role computers play in the two domains.

When one thinks computers and the movies, the usual idea is special effects a la *Star Wars*. In fact there are two ways computers provide imagery in films: through special effects (the Death Star in *Star Wars*) and through rendering (*Pirates of the Caribbean*). In fact, special effects and rendering are different functions that were once done using substantially different computer imaging techniques, but now the systems are much more similar. However, an important distinction remains between movies and games, which operate under different usage models. In movies one does “pre-rendering”; in games, rendering is done in real time. Thus changes in computing technology over the last twenty years have had substantially different effects on the creation of movies and the creation of games.

From the very beginning of computer graphics special effects (e.g., in *Tron*, 1982), software rendering packages used a programmable model that allowed visual effect creators to have essentially unlimited flexibility in creating their illusions. The movie industry needed a standard programming language for this. In response, Pixar Studios (previously the computer graphics division of Industrial Light and Magic) developed the Renderman language. In its simplest form, Renderman is a language designed to describe the color of a pixel and is today the most popular shading language for computer graphics special effects. With Renderman, the capability and machinery for rendering has changed, but the film industry must nevertheless contend with the one remaining limit to creativity: the amount of time needed to

render the final image, which still takes between one hour and twenty-four to compute.

Five years ago a revolution began in interactive experience (i.e., game) rendering techniques. For the previous twenty-plus years all interactive hardware rendering was done with fixed function pipelines, whereby all rendering functionality was fixed and could not be modified (e.g., programmed). There were several different modes and switches that could be combined to create many interesting graphics, but in the end, there remained only a quite limited number of combinations. Now, hardware graphics is programmable, leading not to a literal infinitude of possibilities, but sufficiently many choices as to appear so.

The question is not when interactive graphics and film special effects will converge — they are likely to get a lot closer but will probably never completely converge. This is due to scale. The data used by films to render their effects are now in the several gigabytes for a single image, while interactive graphics is still limited to a few hundred megabytes. The purpose of a single image in movies and games is still quite different. In movies, the image is a static snapshot of a predefined story and can take the previously mentioned one to twenty-four hours to render the image. In games, the image is a snapshot of a dynamically changing environment that can spend only 1/30th of a second rendering the image.

From an image perspective, interactive graphics are becoming quite good. The images of *Fight Night Round 3* are quite close to truly realistic. Many game companies are now using the same production techniques and tools as their film counterparts. In some games, the models that were used by the film are being reused by the game.

In any case, we will see interactive experiences start to approach the quality of film special effects. If the quality of the stories can match that of film, the high-quality interactive experiences are likely to move some consumers to spend more time playing games. And we are within a few years of having MMORPGs that can produce characters that resemble the player<sup>9</sup>. Indeed, of the two things needed for this to happen in MMORPGs, one, technological capability, is already there, and the other, mass adoption, should occur quickly.

In 2005, for the first time, computer games revenue surpassed movie revenue [25]. Although this data reflects *all* types of computer games and includes hardware as well as software, the trend is in the predictable and expected direction: participatory media.

User-created content and participatory media are large drivers of the Internet. Ten years ago, as the U.S. government pushed for the Information Superhighway, the image was of five hundred channels of television. Instead we have gone in a completely different direction: blogs, wikis, sites like de.li.cio.us, which enables users to create and share lists of favorite websites, music, books, etc. (<http://de.li.cio.us>), and Flickr, which enables users to share photos. We have Creative Commons ([www.creativecommons.org](http://www.creativecommons.org)), which has created copyright licenses that enable content owners to allow sharing of their content while maintaining some control over its usage. Similarly, MMORPGs enable the user as creator; indeed, its very business model relies on user creativity.

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<sup>9</sup>Consider *Fight Club 3*, which already has this, <http://www.easports.com/fightnighround3/xbox360.jsp>

So here we have it: film industry revenues are down, game industry revenues — and, in particular, revenue for participatory media — are climbing and have overtaken the film industry for the first time. The MMORPG segment of the game industry encourages users to interact with the content; in some cases, the consumer/producer, the conductor, is allowed to sell in the out-of-game economy materials produced in the in-game economy. Improvements in game rendering enhances the user experience and there are tremendous improvements expected in the next decade as Moore’s law and increased bandwidth continue to impact rendering capabilities. In turn, these improvements will drive the growth in the gaming market, an increase that may come at the expense of the film industry’s box-office ticket sales.

Hollywood has certainly noticed this trend and is producing games, including MMORPGs, that are based on movies [23]. The film industry already enjoys economies of scale (e.g.: rendering technology, movie adaptation to game) that lays a foundation for creating immediate market share in the gaming community. And certain players (particularly Sony) are creating new business models for MMORPG that are less flexible than current models. But Hollywood has, in its back pocket as it were, a product that can be immediately transformed into a new business. While Hollywood makes games from some movies, Hollywood has many properties from which they are unlikely to make games — *The Third Man*, *Casablanca*, *The Prime of Miss Jean Brodie*. Why not create a new revenue stream from these properties aside from making them available for viewing?

There is good reason to believe that user-created content can make new business opportunities from otherwise “dead” properties. Consider that in five or ten years, a new generation who has experience in user-created content and who edits content the same way the current generation edits text, will come of age. Hollywood might have some very hot properties on its hands — if only they will enable users to play with the bits (paying for the experience, of course).

A viewer might take a copy of *Casablanca*, for example, and with editing aids, replace Humphrey Bogart with Ronald Reagan, the original actor slated to play Rick. (Given Reagan’s subsequent roles, this could be a very interesting political commentary.) Or a user, seeking to send an ambiguous message to her lover, could replace Humphrey Bogart with her boyfriend. A user might take two productions of Hamlet and intersperse them, weaving scenes from the Kenneth Branagh version with that of the Lawrence Olivier version. A user might add scenes of his own to the movie or, as was done with the Star Wars film *The Phantom Menace*, a user might edit out scenes not to her liking<sup>10</sup>. The film would not achieve the interactivity of a computer game, but it would enable the interactive storytelling that Brenda Laurel described over a decade ago [20].

Imagine four versions of *Harry Potter and the Half-Blood Prince* on DVD for sale, each with varying capabilities to manipulate the bits:

- View only;
- Cut and paste; no other editing possible;
- Editing using the tools provided;
- The film with no digital-rights managements restrictions save watermarking (so as to enable tracking). Thus all types of editing are permitted, including techniques not envisioned by the studio.

Such controls are certainly technically feasible.

These different versions would be sold with different price tags (or a single version with varying rights each of which can be licensed upon payment of a fee). Some users might buy several versions with different editing capabilities. A customer might view *Harry Potter and the Half-Blood Prince*, and realize that she sees her high-school English teacher in Professor McGonagle — and decides to get an editable version to put the teacher in.

Each of the versions that permit editing would come with a license similar to what exists currently for playscripts: private viewing permitted, public viewing requires permission from the content owner. In no sense could *Casablanca* be shown with General Pinochet playing the part of the German commander unless Warner Brothers, who owns *Casablanca*, agreed to such a public performance. These more liberal licenses for manipulating the content would not affect the brand (something that Disney would care quite strongly about, for example), because there is no public viewing of the content *unless* the content owner agrees to the public performance.

The four alternative ways of using *Harry Potter and the Half-Blood Prince* provide interesting challenges in thinking about the business model. The first alternative, view only, is, of course, the current business model. Each of the other alternatives, offering viewers increasing capabilities for participation in the movies, would be priced accordingly higher. They would need to have some form of DRM in order to track content and prevent leakage; such technology is already familiar to Hollywood.

The other alternatives would, of course, require a significant shift in the business model. Loosen control of the bits and develop a new market: one in which users put themselves in as directors and change the action, adding themselves in as a character, replacing Humphrey Bogart or Reese Witherspoon with themselves (or a character of their creation), becoming a participant in a movie that was never written to include them. Even when implemented correctly, the DRM would allow some leakage of content — just as there is now — but the non-restrictive DRM model would not change ownership rights or ability to go into ancillary markets (e.g., toys, online games, etc.). The movie industry’s rights, and more importantly, industry’s business of secondary distribution, would not change. What would change is the addition of a new business: editable films with non-restrictive DRM technologies that would enable editing and creative content addition by users.

Enabling users to play with the bits and modify movies understandably makes Hollywood nervous. Perhaps the industry could first experiment with an older film, maybe one with a cult following, such as a Marx Brothers movie. In some sense, the experiment has already happened. Efforts by Trekkies, and by Star Wars aficionados, are steps in this

<sup>10</sup> *The Phantom Edit* is a fan edit of *The Phantom Menace* that has edited some of the scenes with Jaja Binks and rearranged other scenes and shots [2]. BBC News reported that Lucasfilms did not object to the edited version; and quoted a company spokesperson, “At the end of the day, this is about everyone just having fun with Star Wars.” According to the BBC story, Lucasfilms would, “not pursue fans ‘as long as nobody crosses that line — either in bad taste or in profiting from the use of our characters.’ ”

direction. Here we are suggesting a full-fledged experiment with Hollywood owning the technology and reaping the profits: release the film on DVD with a variety of editing licenses, watermarking to enable tracking and prevent release of unauthorized copies, and see what happens. Is there a business there? The growing MMORPG audience share indicates that Hollywood might be quite surprised to find it has a new business waiting for exploitation.

These proposed business models would be a far cry from the movie business of 2006, but the movie business has seen radical change before. Hollywood fought VCRs very hard [19], but after the Sony case<sup>11</sup>, the distribution model for movies changed; now fully three-quarters of movie revenues come from video distribution. (Note: this is new audience share, not the result of attendance shifting from theaters to video rental.) We would not expect that in 2016 we would have the same film distribution model as we do now. Digitization has worked changes in the movies. Digitization enables for film what has always been possible for art, literature, and music: the riffs and variations that create new art, new literature, and new music.

Strength in the MMORPG market is greatest where participatory media as a social phenomenon is greatest — China, for instance. It is also true that in the Asia/Pacific market (specifically Korea and the PRC) there is the least tolerance by restrictive licensing terms on who owns the game assets. Serving and capturing the leading position in this target market would require a different business model than the traditional Hollywood fare. It is also a huge business opportunity for someone, and if not Hollywood, then maybe Bollywood will partake of it.

Will Hollywood jump on participatory film-making as a new business opportunity? A model of loosely-applied digital-rights management would, by definition, mean losing control; we believe that it is a trade worth making for the gain in audience and consumption. We believe releasing films under non-restrictive DRM that enable audience editing would be a major win for the user, for technology developers, and for content producers. Using such technology would mean different business models for Hollywood, but contemplating Hollywood of 2016 means looking beyond the Hollywood of today. A model of a variety of user-friendly releases of the same film that enable manipulation of the content would put Hollywood in a position to compete with all forms of interactive media, and could leave the movie industry in a very competitive place indeed.

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<sup>11</sup>*Sony Corp. v. Universal City Studios*, 446 U.S. 417.