Balancing the Tensions Between Rationalization and Creativity in the Video Games Industry

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This paper investigates the forces that influence creativity in the video games industry. We adopt a qualitative approach to guide the development of grounded theory across multiple levels of analysis, including the industry (consisting of multiple actors), organizational, and individual creator levels. Our study shows that business and production interests currently drive the rationalization of video game production. There is a maturing trend, with product designs becoming well established as genres, and consumers and publishers desiring incrementally innovative games. This leads publishers to focus on acquiring intellectual property, and publishers and studios alike to make incrementally innovative sequels. The increasing complexity of products leads to further rationalization in their development. However, the need to satisfy consumers' continually evolving tastes and game developers' inclinations to be creative also creates tensions with these rational forces. Different actors balance these tensions differently. Studios may seek to balance these by shifting between more and less innovative products, by creating original intellectual property to increase their bargaining power with publishers, and by iterating and repositioning products during development to adapt them to the market. Publishers may enhance their portfolio by hiring highly creative designers into their stable. New products are created through combinative creativity, that is, the recombination of existing ideas from different sources into new products. The connection of combinative mechanisms with the balancing behavior at the firm level provides a means for understanding the evolution of innovative products and, therefore, industries.

Key words: creativity; video game; creative industries; industry evolution; combinative innovation

1. Introduction

As industries evolve, product innovation usually gives way to efficiency considerations and process innovation (Utterback 1994). Abernathy and Utterback (1978) suggest that the rate of product innovation is highest in the emergent, or fluid, phase of an industry. That phase is usually associated with many entrants and design variations. Eventually, the market locks into a specific, dominant design that is based on certain firms' superior technology, productivity, fit with the market, and capabilities (Anderson and Tushman 1990, Henderson and Clark 1990, Klepper and Simons 2000). This cycle occurs because technological discontinuities offer better substitutes for the older dominant technology: Periods of dominant designs are followed by product variation, which are followed by new dominant designs (Anderson and Tushman 1990). It is yet to be determined whether this traditional model of industry evolution occurs over a broad spectrum of industries, especially those that are purportedly oriented around the need for their outputs— and therefore their employees—to be creative, i.e., the creative industries.

Creative industries have been defined to include a broad range of sectors such as film, video games, advertising, publishing, software, and computer services (Department for Culture, Media and Sport [DCMS] 1998). In this paper, we confine our definition of creative

industries to the cultural industries (e.g., films) as well as entertainment sectors such as video games. One unique feature of creative industries is their use of intermediaries, who act not only as judges of talent and capability (i.e., gatekeepers), but also as financiers and distributors (Caves 2000). Creative industries are defined as much by the creative acts of specific individuals as they are by project teams or firms (Caves 2000, DCMS 1998).

Although they are characterized by the continual development and renewal of intellectual property (IP), firms within creative industries also tend to mature over time. Just as in manufacturing industries, product decisions in these firms tend to become more market driven as the firms mature. This is true, for instance, in the prevailing high-budget but conservative views of the major Hollywood film studios (Epstein 2005). The film industry's maturation was accompanied by certain film genres becoming design standards, with films within those genres accounting for most of the industry's revenue (De Vany 2004, Epstein 2005). Creative products such as films and video games are increasingly complex and costly to develop, which in turn leads to a rationalization of the production or product development process. *Rationalization* is defined in this paper as the predominant focus on business interests or productivity-oriented production processes, usually at the expense of creativity. In creative industries, rationalization or the pursuit

of rational interests can constrain creative practices such as impromptu acts or serendipitous discoveries.[1] An example is the adoption of processes such as detailed scene-by-scene scripts that improve the efficiency of film production, but that could curtail creative on-the-spot ideas during production.

Economic forces such as vertical integration and the consolidation of the industry into a few large generalist firms can reduce innovation in the creative sectors (Mezias and Mezias 2000). Furthermore, entertainment products and services such as films are notorious for having (1) a hits-oriented nature (i.e., a small subset of products responsible for generating the larger proportion of the total revenue); (2) a short product life cycle in the marketplace (Epstein 2005, Hirsch 2000, Robins 1993); and (3) difficulties in predicting product acceptance (De Vany 2004). All these factors tend to reinforce the conservative nature of new product decisions, fostering incremental innovations (where *incremental innovations* typically involve minor changes to the products' components).

Nevertheless, as Lampel et al. (2000, p. 266) note, "Competition in cultural industries is driven by a search for novelty. However, while consumers expect novelty in their cultural goods, they also want novelty to be accessible and familiar." Large firms arise with industry maturity, but specialist firms arise with resource partitioning; this last development, in turn, stimulates innovation in film genres or classes (Mezias and Mezias 2000). Tensions arise, such as the tensions between profit maximization and creative forces (Glynn 2000), and those between individuals and broader systems (such as institutions) when the individuals assert themselves during the creative value-creation process (Eisenmann and Bower 2000, Lampel et al. 2000, Starkey et al. 2000). In other words, the maturation and evolution of creative industries tend to be driven by a broader, ongoing tension between forces for creativity and those for rational (e.g., business) interests. In part because of this tension, particular creative industries may not settle down to a dominant design and the subsequent long phase of incremental innovation, as occurs with traditional manufacturing industries.

Our objective in this paper is to explore how these opposing forces play out at various levels as a particular creative industry evolves (as seen through the perspective of selected individuals and firms), and what the implications are for our understanding of how dominant designs occur. Specifically, we use qualitative data collected over a three-year period to study how the tensions between creativity and rational interests are *balanced* (i.e., resolved) within the video games industry.[2] Our paper is organized as follows: Section 2 discusses our research focus and methodology. Section 3 describes the evolution of the industry and how industry actors have provided a rationalizing influence on creativity. Section 4 illustrates how industry actors balance their needs for creativity with the more rational needs of production and commercial interests. Section 5 provides a synthesis of the balancing efforts of the game development studios, and discusses how the findings relate to the literature. Finally, §6 presents conclusions with implications for the industry and for future research.

2. Research Focus and Methodology

2.1. Research Focus

Our research focus is the U.S. video games industry (hereafter, the games industry). Video games are sophisticated products that combine advanced software technology with content and interactive qualities. The games industry is growing and is increasingly respected; it reached $7.3 billion in gross revenue in the United States in 2004, not far behind the U.S. film industry's gross box office receipts of $9.53 billion that same year.

The games industry is similar to other creative industries in a number of ways. For instance, games require their workers (known as "developers") to perform significant amounts of creative thinking, and games need to satisfy consumers' evolving expectations. However, game development differs from the development process of other creative industries in that it needs computer programming, design, project management, and substantial amounts of testing (Bethke 2003). In addition, the design process tends to be ongoing during development, with the design affecting other components such as the programming code (or "code") as the development proceeds (Tschang 2005). Game development is complex, and games need rational structuring, i.e., to be developed systemically to improve productivity and to ensure the certainty of the games' development. This suggests a similar process to the rationalization of commercial software development (Paulk 1995, Chrissis et al. 2003). This combination of rational and creative aspects can cause tensions in game development similar to those seen in other creative industries.

As with other creative industries, the games industry has three main actors: independent studios, publishers, and consumers. The studios do the creative work: They design and develop the games. Publishers serve as gatekeepers and provide almost everything else, including financing and distribution. Publishers also supplement the independent studios with resources for testing and for developing components like the art, or develop products themselves in their own development studios. Consumers directly and indirectly influence the games' development when they communicate their needs and abilities to studios and publishers. As we show in §3, the interactions among these three actors strongly influence innovation within the industry.

Given our interest in how creative industries evolve, it would be useful to understand how we measure creative output, or innovation, in game designs. Game designs

"determine what choices the player will be able to make in the game-world and what ramifications those choices will have on the rest of the game" (Rouse 2001, p. xviii). Although there are several ways to measure individual creative output (see, for example, Sternberg 1998), it would be more appropriate for us to adopt measures specific to the games industry. One such measure involves specifying whether a particular game is an innovation within or between genres, or whether it is a new genre. A particular genre (or definitive type of game) can be uniquely defined by a combination of components. Usually, these are the form of *gameplay* (definable as "the formalized interaction that occurs when players follow the rules of a game and experience its system through play" [Salen and Zimmerman 2003, p. 303]); the particular visual style (such as a three-dimensional [3D] perspective); and sometimes the genre-specific story or background, such as the fantasy setting and heroic quest that is common to role-playing games. The game's design generally encapsulates all these aspects (with gameplay following from the game's design), and thereby forms the heart of a game's distinctiveness. On the one hand, a *new genre* can be defined as a radical innovation (Henderson and Clark 1990). On the other hand, games that extend a genre while imitating established forms of gameplay, visual styles, story, and means of integrating these components (e.g., how the storyline fits the game) can be considered as incremental innovations of an existing genre. Some observers are concerned that the industry is largely creating games with increasingly detailed content that promotes cinematic quality and *immersiveness* (defined as the quality of being in a realistic virtual environment), rather than new forms of gameplay (Dobson 2006).

2.2. Methodology and Approach

To study the issues of interest within the games industry as thoroughly as possible, we used qualitative data collection, analysis, and reasoning methods as developed in the literature (Glaser and Strauss 1967, Lincoln and Guba 1985, Miles and Huberman 1994, Yin 1994). In particular, we adopted Lincoln and Guba's (1985) process involving (1) purposive sampling, (2) the inductive analysis of the data, (3) the development of grounded theory, and (4) the projection of next steps.

In our first stage, we sought emergent research themes from our initial interviews with a range of senior managers and experienced individuals within the industry.[3] We conducted interviews in March 2003 with 19 interviewees drawn from 17 firms. Each person interviewed was a lead designer or studio head (and almost all of the latter were involved in game design as well). About half of these interviewees were considered to be at the top of their profession, and most of the rest had been involved in key roles in well-known studios or on well-known games. Each interview lasted between one and two hours. As advocated in the literature (e.g., Eisenhardt 1989), we used semistructured, open-ended interviews, designed to allow phenomena to emerge rather than to seek only confirmation of prior views. We also attended trade and game development conferences, including the Electronic Entertainment Expo (E3) in 2002, and the Game Developer's Conference (GDC) in 2003 and 2004.

Our objective at this stage was to understand how creativity was practiced in the industry, what creative practices and processes looked like, and what factors influenced these creative practices. We partly redirected our focus as themes emerged during the interviews. Several characteristics of creative practices were revealed during this first stage of the research. One was the observation that creative individuals, including designers, work in groups on projects, and within larger social and industrial contexts that influence or constrain their creativity. An example of this was the observation by three interviewees of the tensions between their creative natures and the more conservative nature of publishers. These interviews, as well as secondary information that we later collected on the industry, suggested a trend toward incremental innovations, i.e., increasingly immersive games, games of the same genres, sequels, and games with similar gameplay.

We also collected secondary information, such as project *postmortems* and articles from the industry's main trade publication—*Game Developer*. Postmortems are reports written after project completion that detail the lessons learned, specifically identifying the helpful or damaging factors that influenced each project's development. Factors ranged from production-related issues such as scheduling to product development issues such as design and technology, and to external relationships such as those between the studios and publishers and between the studios and consumers. Of our set of 76 postmortems, 40 were of sequels to existing games or of games based on licenses. We defined games made with licensed IP or sequels as our cutoff for determining whether a particular title was *incrementally innovative*. Incrementally innovative games essentially extend a genre and do not involve significant changes in gameplay. Following Miles and Huberman (1994), we analyzed the postmortems using established protocols for coding and classifying their content. These were initially used to seek phenomena, but later also served to validate issues emerging from the fieldwork, such as the association between incremental innovations and products whose development was focused on meeting consumers' expectations.

In the next stage, to better understand how creativity occurs and could be constrained, we designed a follow-on cycle of purposive sampling to clarify how individual designers work in project settings. We used an ethnographic approach to systematically examine the design and product development process across time, across

designers and teams, and across projects. Our ethnographic studies were of the four studios (each labeled with a fictional name).[4] One studio (IGF-Winner) was started by an individual during our research period. The second studio, Strategy Games, specialized in city-building games and was formed with 12 developers (later rising to 20). The third was a well-known studio: RPG Games, with 25 developers. The fourth studio, Action Games, had 20 developers, and made console action games. We made multiple visits to each of the four studios, conducting site visits in March, June, and July 2003; March 2004; and February 2005. We spaced our visits to each studio to try to capture as much of the product cycle as possible, as well as the creative and development-related phenomena occurring over that cycle; we succeeded in capturing an entire product cycle across all studio visits. As part of the ethnography, we sat in during 45 formal and informal team meetings, and conducted formal interviews at these studios with most of their personnel in residence, covering, in all, 41 developers. Finally, we informally interviewed more than 50 other developers and publishers' employees at game developers conferences (GDCs) and elsewhere.

We repeatedly visited studio sites, focusing on understanding the roles of designers as well as other emerging themes. We observed two related ways by which studios balance the different tensions between creativity and rationality: (1) by design considerations and iterations that designers created during a project; and (2) by how studios chose their next products to address problems and issues encountered with previous products, particularly innovative ones. We also recorded other observations, such as the fact that developers were generally avid game players, who tested games by thinking consciously as users throughout the development process. In later analysis, we examined the postmortem data to validate our observations on the tensions that were occurring in the industry and the ways in which these were being resolved by studios' balancing and adaptive mechanisms.

3. Rationalization in the Games Industry

We now describe the maturing of the games industry in terms of the actors' behaviors and the production processes.

3.1. The Evolution of the Games Industry

It has been said that "if the 1970s were characterized by innovation and the 80s were about expansion, the 90s were a time of maturation" (DeMaria and Wilson 2002, p. 243). Several of the major genres were established by the early 1990s. These major genres included the first adventure games, which were based on versions programmed in 1972, the first-person shooter, popularized by *Wolfenstein 3D* in 1992 and *Doom* in 1993; the first role-playing game, popularized by *Akabeleth* in

1980, itself the forerunner to the *Ultima* series; and various simulation and strategy subgenres, including the first flight simulation game in 1979 and the first city-builder game in 1989. However, even in the 1990s, innovation continued within genres, and a few new genres were added: the real-time strategy genre (*Dune II* in 1992); the music genre (*Parappa the Rapper* in 1996); the massively multiplayer online role-playing game (MMORPG) genre (*Ultima Online* in 1997); and the virtual-life genre (*The Sims* in 2000). The studio head of Strategy Games noted that innovation did occur between genres in the 1990s, but that many games tended to be very focused within established boundaries.

Table 1 shows the recent trends with the 20 top-selling computer games from 2000 to 2004. A remarkable trend is that of first-person shooter games, which are some of the most immersive, visceral, and controversial games available (Kushner 2003). The number of such games steadily increased from one title in 2000 to seven in 2004. Table 1 also shows how other genres or categories have peaked or declined. Data on the different genres of computer games ranked by the proportion of purchases reveal that, in 2004, strategy games were most popular (26.9%), with family and children's (20.3%), first-person shooters (16.3%), role-playing (10%), adventure (5.9%), sports (5.4%), and action (3.9%) genres constituting the remainder (Entertainment Software Association 2005). In contrast, by far the most-played console game categories were action (30.1%) and sports (17.8%), followed by first-person shooters (9.6%), children and family entertainment (9.5%), racing (9.4%), role-playing (9.4%), and fighting (5.4%). While this data reflects the preferences of the total market for each genre, Table 1 reflects specific hit games and their genres, which are of equal if not greater interest for this study.

New genres tend to be created and old ones survive by an evolutionary process (Tschang and Szczypula 2006),

Table 1 Counts of Top 20 Computer Games Classified by Genre/Subgenre, 2000–2004

Genre or Subgenre	2000	2001	2002	2003	2004
First-person shooter	1	1	2	4	**7**
Role-playing games	1	2	2	2	**3**
Real-time strategy	4	4	1	**5**	2
Action	1	1	1	0	0
Virtual life	2	4	**6**	5	4
Business strategy	3	3	2	3	3
Action-adventure	0	1	**2**	0	0
Flight simulation	0	0	0	1	1
Sports simulation	0	2	**4**	0	0
Other simulation (e.g., city building)	**4**	2	0	0	0
Other (education, casino, trivia)	**4**	0	0	0	0

Source. Author's summaries based on NPD Funworld data cited by the Entertainment Software Association, which are available on request.

Note. Unique peak numbers are in bold.

in part because game developers themselves are serious consumers. For example, MMORPGs had roots in multiuser dungeons (MUDs), which in turn had roots in text-based adventure games. MMORPGS also had roots in early online games and role-playing games (DeMaria and Wilson 2002). Similarly, by increasing their immersiveness via 3D technology, other genres or subgenres such as real-time strategy and role-playing games have extended their life spans.

3.2. Industry Actors and Their Interactions
One early designer who had eventually left the industry noted,

> 1986 is when the diversity of the games industry peaked and then slowly started narrowing, then in 1990, the narrowing process accelerated and all through the late 80s and early 90s, I was ranting at the industry saying "That we've got to broaden, not narrow,"...by about 1993, I realized that I had lost.

Starting in the 1990s and going into the 2000s, several factors dictated a more professional and corporate image of games: Large publishers emerged, IP became increasingly important, and project and team sizes increased. The rise in incremental innovations can be traced to how the objectives of different actors shifted over time, and how these actors interacted with one another to seek certainty by developing within well-understood genres.

3.2.1. Publishers. Our analysis suggests that two issues characterize publishers: their focus on IP and their tendency to control the development process. As one studio head noted,

> ...the publishers are reading one another's hype and telling you that gamers (i.e., consumers) don't want X, Y, and Z. That's what interests me about creativity...how it's completely dominated by people who are not creative. It's completely dominated by the business people.

Publishers themselves do not see it that differently:

> Like other entertainment companies, our business is based on the creation, acquisition, exploitation, and protection of intellectual property...in the form of software code, patented technology, and..."content." (Electronic Arts (EA) 2005)

Increasing project cost has driven publishers to bank on combining established gameplay with interesting IP that are potentially interesting to consumers. One well-known designer and studio head, who once worked for a major publisher, observed that the games industry is

> becoming a service industry like Hollywood. I think it's pretty sad...it seems that right now the thinking is that the only guaranteed hits are the games based on hit films. When they write a $30 million marketing budget or whatever, why take a risk on anything else.

Publishers generally consider *content* IP (used interchangeably with IP hereafter) to be the most valuable

part of a game (Roch 2004). Content IP includes the art, story, and game world, where the *game world* is defined as the game's setting, including the background, history, and types of objects within it. The game world distinguishes each game's fictional world and environment from all other games'. While this IP had traditionally been developed by the games industry itself, the links between games and other industries, especially the film industry, have increased. In fact, of the top 25 console games in 2002, only two used original IP that the video game studios themselves developed (meaning that they were not based on licenses from movies or were not sequels to prior games).

Publishers are also interested in IP because mass-market tastes are often defined in many media around how IP is acquired. EA explicitly states that its goal "is to develop titles which appeal to the mass markets" (EA 2005, p. 21). Three of our postmortems note that publishers strongly encourage studios to make their games more user friendly. This also relates to the nature of the industry, which focuses on hits. As EA notes, "our business is driven by hit titles" (EA 2005, p. 21). EA's most successful games are its franchises. These are highly incrementally innovative in nature and occur largely within the established genres. For instance, EA owned 9 of the 10 top sports game titles in 2005 (McDonald 2005). EA itself recognizes that it is primarily not in the business of innovating: "We have developed, and it is our objective to continue to develop, many of our hit titles to become franchise titles that can be regularly iterated" (EA 2005, p. 22).

There has also been a tendency for publishers to create internal studios so that they can exercise more control over resource allocation and the game development process, such as the exercise of quality control and scheduling (Roch 2004). In 2003, the top 20 publishers sourced only about 45% of their released titles from independent studios (Donovan 2004). Publishers have built internal studios primarily through acquisitions (Rogers 2004). However, some observers suggested that in the well-known case of EA's acquisition of Westwood Studios, EA might have acquired the studio more for the sake of acquiring the studio's IP than for the studio's capability. Westwood's talent and capability were eventually absorbed into EA's Los Angeles office, which itself was eventually heavily scaled back. Other publishers, too, have behaved very assertively—if not rapaciously—in pursuing studio acquisitions and IP (Pham 2002). One interviewee noted that although EA had given him a blank slate several years ago and had subsequently approved his fairly innovative game, EA likely would not have funded his game today, given its desire to achieve higher sales for each game. Despite this focus on IP, sales of film-based game titles at EA have suffered recently, in part because rushing the games out to coincide with a film's release date or emphasizing

the designs less than the content IP can eventually hurt these games' chances of success (McDonald 2005).

3.2.2. Early Designers and the Rise of the Studio. Most early video games, and even some in the late 1980s, were developed by one, or at most two, developers (as seen in profiles by DeMaria and Wilson 2002). According to the head of Strategy Games, there was more experimentation during this early period, possibly because games could be designed and developed by a single individual in a matter of months. This, in turn, involved a lower cost of failure and allowed considerable risk taking.

Over time, however, project- and team-based studios emerged. These studios typically maintain a core full-time workforce of talented employees in preparation for new projects (Bethke 2003). In many project teams, the designer was and still is the center of the development effort (e.g., Warren Spector who designed *Deus Ex* at Ion Storm-Austin). Nevertheless, it was largely recognized by our interviewees that, in current teams, the designer is not necessarily the key actor in completing the game, and that a team's efforts are also critical for a game's development. It was also noted by one interviewee that because not all studios have a star designer, they will often seek to maximize team input to compensate for the missing creative functions of such a designer.

Most new genres tend to arise from forms of game-play invented by individual designers (see DeMaria and Wilson 2002). Traditionally, an individual's creativity is seen in how lead designers came up with the core concept that underlies an entire game and its detailed game design. The creative vision of the initial designer or design team would also shape on a daily basis how other developers implemented the game.

Our interviews with lead designers revealed that they create new game concepts by using their diverse backgrounds, imagination, inspirations, and insights. New genres require even greater degrees of variance in thinking styles, and the designers tend to be exposed to domains significantly different from games. For instance, in conceptualizing the game *Parappa the Rapper*—the definitive game for the music games genre—the rap musician Masaya Matsuura "had the inspiration to play a TV (video) game as if it were a musical instrument" (Baba and Tschang 2001, p. 501).[5] *PC Gamer*, one of the leading consumer game review magazines, went so far as to dub some of these designers Game Gods—those with the capabilities to make innovative games.

Publishers heavily influence the type of game the studio makes. The publishers' greatest influence may be at the conceptualization or preconceptualization stage, when the publisher decides on the genre it wants, in effect subjugating the initial creative process to a rational decision. The head of the independent studio RPG

Games notes how studios decide on new game ideas:

> Sometimes it's design driven...like, "Oh, I have an idea for a game." Sometimes it's market driven, as in, "Well we really should be doing a first-person shooter." Sometimes it's publisher driven. Publishers come to you and say, "We have a game we want done."

In many cases, studios will take at least part of the lead from publishers. The head of Strategy Games noted that, in 2005, his firm sought to scour the archives of IP from older media (e.g., films) for franchises on which they could hinge their games. However, he also noted,

> I also think there's a lot more room for originality and creativity. Some of the most interesting things in the world are not the things that 5 million people like. They are the things that 200,000 people like. There's still plenty of room to do that and make money on the PC, but the problem is that the publishing model has gotten where the publishers can't make money unless things are really huge, and they put a lot of money into it.

The publishers' advantage in resources has given them a position of strength in negotiations with studios, with the publishers usually retaining the rights to the IP pertaining to the characters and game world, and studios owning only the programming code. As explained by the head of Action Games, publishers usually fund the game's development, and therefore seek most of the royalties, with the studios only starting to see royalties if the game becomes a *hit* (which we define as a game that sells at least one million units). Unfortunately for the studios, few games become hits.

A studio head, one who had previously worked for publishers, observed that the publisher's conservative nature may stem from the fact that many publishing heads themselves know very little about games or game development. Some publishers came from outside the games industry and were funded by other sectors or private financiers. In fact, tensions occurred even in the early days of the industry. For instance, one of Atari's early CEOs came from outside the industry, and had a low regard for developers, seeking to ensure that they got as little recognition or reward as possible (DeMaria and Wilson 2002, pp. 40–41).

Finally, it has also been noted that retailers can influence studios and publishers. As explained by a studio head, retailers of games tend to have limited shelf space, which means they can carry only the more popular titles, further constraining the potential for developing creative games.

3.2.3. Consumers. Consumers also strongly influence the publishing and development decisions in the games industry. Although the typical game consumer used to be a male under 30 years of age (most often between 13 and 19), games are increasingly being played by other age groups and by females. The typical consumer tends to buy games within genres rather than

games combining different genres. The consumer's taste for familiarity as well as desire for novelty also contributes to the tension in game design. As the postmortem of the *Age of Empires II* game notes, "The game business is brutal to those who fail to move forward with the times, but it's also equally brutal to those who experiment too much and stray from the expectations of the players" (Pritchard 2000, p. 53).

Our analysis revealed that consumers directly engage with the studios and rationalize game development in two ways. First, consumers offer feedback to the developers on their experience interacting with the game. For instance, design meetings often involve developers' ongoing iterative fine tuning of the overall game's design (as seen at Strategy Games), as well as the refining of the level designs[6] (as seen at Action Games), to improve their playability. As a result, hit games (e.g., Blizzard's *Warcraft* series and Valve's *Half-Life*) were not necessarily the most innovative, but were certainly the most well tuned. Of the 17 postmortems that explicitly indicated concern with how consumers or fans would perceive the game or gameplay, 11 were classified as incrementally innovative games, i.e., as sequels or based on IP licenses. For instance, a sequel called *Unreal Tournament*, according to its postmortem, relied strongly on "direct communication with the gaming community.... Nearly every employee...frequented message boards dedicated to the subject" (Reinhart 2000, p. 52).

The second way in which consumers engage with studios is by becoming developers themselves. As we found in our interviews, many studios ensure that their developers are also serious players of games, because that helps in the game development and tuning process. At Irrational Games, "In all our interviews (of potential employees), one of our most pressing questions to ourselves was 'Does this person get games?'" (Chey 1998, p. 54).

Designers' roots have changed over time, especially as the designer's role has become more niche oriented. Many well-established lead designers entered the industry as programmers. Partly because of this programming side and the smaller scale of projects, these earlier designers were able to independently conceive of, prototype, and implement innovative gameplay. However, more-recent designers have come straight from university and made their way into teams through general or nontechnical paths, usually beginning as testing personnel and then moving up to become level designers. The combination of specialized level-design positions with the availability of level-design tools has made the design process more general and more accessible. This, in turn, has allowed more game players who do not have formal programming training to become designers after receiving on-the-job training.

3.3. Rationalization of the Game Development Process

The need to manage the increasing size and complexity of games and their development has resulted in a search for process improvements, not necessarily driven by concerns such as cost minimization, which are traditionally seen in other industries. The complexity of games can be measured in various ways, including (1) the scale of the effort and resources engaged (cited by interviewees), (2) the number of lines of code (cited by postmortems), and (3) the richness of game content, such as the complexity of individual graphic objects and environments. The latter is largely driven by the availability of ever more powerful computing and game console platforms (Gallagher and Park 2002, Schilling 2003). Since the early 1990s, advances in 3D technology have led to increasingly immersive games. Team sizes have also increased with project complexity. A sample of 48 firms from our postmortem data (from 1998 to 2002) show the average team size to be 20 developers; today, larger studios—such as those within EA—report 100 or more developers on a single team. This trend is partly due to the increasingly detailed content of the games, which has necessitated increases in the numbers of artists and animators within each team, as well as the increasing need to localize content to multiple countries and their languages.

As a consequence of these influences, game development is becoming more rational and process driven. There is a preoccupation with production-related issues (e.g., the tight schedules), product development–related issues (e.g., the need to concurrently develop different components), and organizational issues (e.g., communication problems within the team) (Tschang 2005). In fact, the three studios in our ethnography started out with no full-time producer for their first projects, but eventually hired producers to handle scheduling and resource management issues. Development costs also increase with scale, and various industry accounts indicate that costs have gone from a few hundred thousand dollars per game about 10 years ago, to several million dollars or more for a high-quality game today.

Furthermore, increasing project and team sizes has led to the emergence of hierarchies (i.e., lead members who coordinate the work of the personnel in each particular area, e.g., art or design) and the partitioning of work within project teams. Even in fairly innovative games such as the RPG game *Deus Ex*, structure is important: "There can only be one boss for a project, there can only be one boss for each department, and department heads have to answer to the person heading up the project" (Spector 2000, p. 57).

A lead designer of various U.S. and UK studios noted that this specialization or division of labor has reduced the individual's creative scope:

> In the past, the core game may have been developed by two or three people. You now may have ten people in the team but seven of them are cut off from the process,

because they are specialized. But you still have the same three (core design) people...I am sure everyone in the team will still be able to contribute ideas. It is just that the amount they contribute will become smaller and smaller because there are so many more ideas coming in.... It just may limit the amount of creative input individuals in the team have (although) they can focus more on their specialized area.

At an extreme, as pointed out by three interviewees, a significant number of developers in some projects are not even informed on a regular basis as to the designs' evolution. However, a trade-off may exist because encouraging creativity not only empowers team members to contribute innovations and details by fully using their talents, but also helps to motivate them. (At least 10 postmortems indicated that a project heavily relied on and encouraged team members' creative inputs.)

Another trend is the changing nature of the designer's role. Many lead designers act less as visionaries or conceptual idea generators and more as coordinators and negotiators with the team on a more rationally defined design, e.g., one that is designed to a publisher's requirement or someone else's vision. This suggests a rationalization of the designer's role, and a potential reduction in the opportunities to come up with significantly creative ideas.

Yet another trend is the increasing reliance on development practices that improve project performance. An examination of the postmortem data suggests the use of two development practices to mitigate the uncertainty or reduce the effort of making creative products. The first is the use of prototyping by studios to ensure that the basic concept's gameplay is workable, and to create demonstrations to gain publisher funding. The lack of prototyping can also cause problems when unproven concepts fail, or when they need substantial tuning, as indicated in the postmortem on *Thief: The Dark Project* (Leonard 1999). The second is the use of software tools to help automate the process of developing code and content. This includes the use of software such as editors and scripting tools to help create level or scenario designs, and animation packages such as *Maya*, which also improve artists' and animators' productivity. However, Crawford (2003) points out that this could be focusing designers on further exploiting (e.g., being more productive with) designs rather than exploring (i.e., being more experimental with) designs.

In summary, it is evident that a rationalization has occurred—within markets (with the changing of preferences) and in the development process. Figure 1 summarizes the several ways in which these rationalizing influences affect product creativity, both in terms of how they are demanded and how they are produced. (The direction of influence is shown with either a positive or negative sign.) This rationalization was a significant cause of the large number of incrementally innovative games being released by the games industry. We esti-

mated from publicly available data sources that of the top 20 publishers' game titles in 2002, the percentage of new releases based on licensed IP was about 36%, the percentage based on sequels to past video games was about 56% (both of which can be used as rough measures of incremental work), and the percentage of new releases based on original IP was only about 25%. (These add up to more than 100% because some titles were dual categorized.)

Most of the relationships shown in Figure 1 are negative as far as their impact on the creativity of products. In §4 we will illustrate how studios and publishers also seek creativity to generate products that are more than incrementally innovative, in the hope of creating greater revenue, fame, and, therefore, self-determination.

4. Industry- and Firm-Level Mechanisms to Foster Creativity

While simultaneously adjusting to rationalizing influences (i.e., production issues like efficiency, as well as business interests), the games industry has had to ensure that at least some creativity is preserved. This involves innovating, mostly incrementally, but occasionally radically (i.e., with new genres). Successful new games are not simply replicas of established games, but must contain something new to satisfy consumers' need for novelty without departing so much from the valued parts of the genre or original game (as in the case of sequels). For instance, in *Command and Conquer: Tiberian Sun,* the major issue was "[how] to maintain the feel of the original. When making a sequel, the question that always has to be answered first is, how far do you stray from the original game to make it compelling, yet still familiar?" (Stojsavljevic 2000, p. 47). We will next explore industry mechanisms and the behaviors of different actors that help foster creativity as the games industry matures.

4.1. Industry-Level Competitions
At the industry level, game competitions such as the Independent Games Festival (IGF), held every year at the GDC, provide publicity for innovative developers who do not have a publisher's support. The IGF provides a forum for showing independent work, in much the same way that the Sundance Film Festival provides a forum for independent movies. Its goal is to highlight and reward the bright ideas and innovative concepts that may not be commercially saleable yet, but that could become hits. Unfortunately, the IGF has only partly achieved its goals: Independent games are usually not polished enough to succeed as a commercially saleable product, or might not have a team strong enough to convince a publisher of the game's prospects. Our interviews at the IGF highlighted the difficulty that even IGF winners face in securing support and gaining business success. For instance, over the course of three years we repeatedly interviewed an independent game designer

Figure 1   Influences on Creativity that Reinforce Incremental Innovation
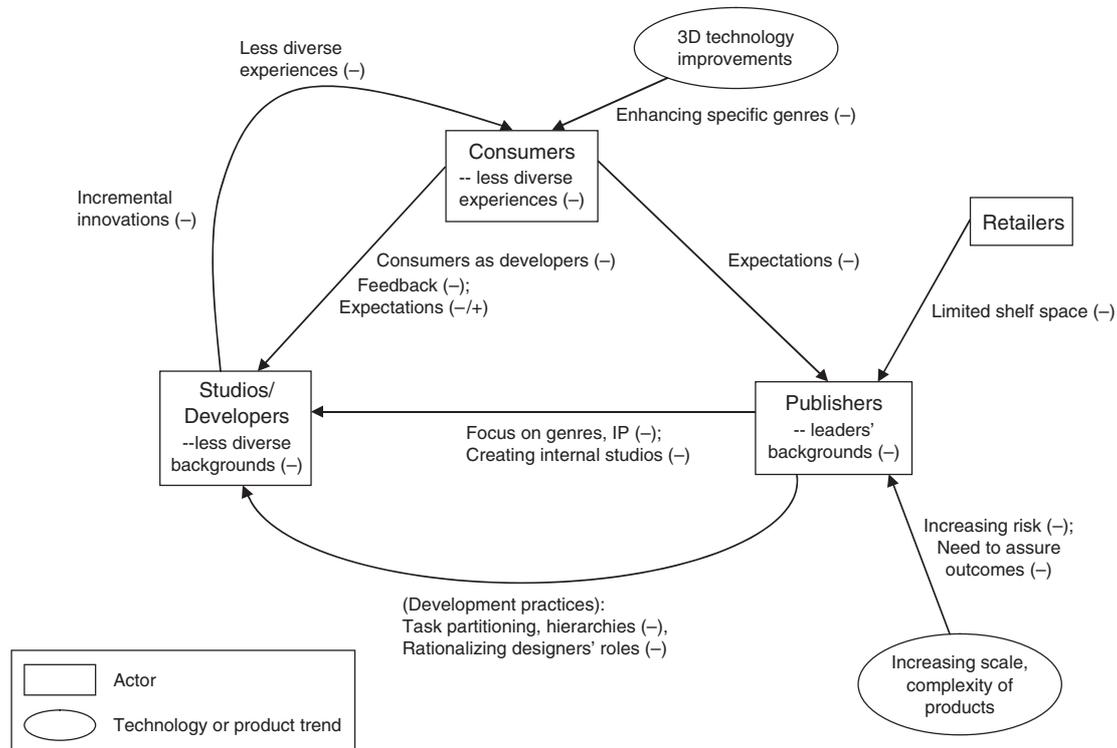
whose Web-based game won the best overall and best design awards at a recent IGF. Shortly after he won the competition, he sought to scale up his work by forming a company, IGF-Winner; he had hired 16 employees by mid-2005. However, as of our last interview, most of the projects that IGF-Winner had obtained were publisher dictated. None of the ideas generated by IGF-Winner, with the exception of the founder's award-winning game, had been accepted by publishers. Another IGF finalist noted that it was not easy to get Web-based game distributors such as Popcap—let alone the publishers—to list his independently developed games.

4.2. Publishers' Attempts at Balancing Creativity
Although many mainstream publishers largely seek incremental innovations, some also engage in a portfolio diversification strategy by hiring innovative independent studios for specific projects, or by hiring genre creators or other highly creative designers and preserving the intellectual space for them to create new products. There are few proven creative geniuses husbanded in this manner by publishers. The small group includes Will Wright and Peter Molyneux at EA, Shigeru Miyamoto at Nintendo, and Masaya Matsuura at Sony Computer Entertainment. EA essentially allowed Wright free rein to create new concepts after EA acquired Maxis, the studio that he had co-led (Keighley 1998). However, one reason for this was that Wright already had a successful track record and considerable name recognition.

Increasingly, even reputable designers working within publishers' internal studios have to sell their ideas to project team members. One well-known designer at a publisher's studio noted that it was necessary for him to obtain buy-in on his innovative ideas from a wider cast of people, including the people who approve the projects, as well as his own team members, to move forward with his ideas.

4.3. Studios' Attempts at Balancing Creativity: Product Strategy over Time
For the most part, independent studios drive creativity and innovation within the games industry. Spin-offs from existing studios usually occur when employees leave to pursue fresh game design ideas, or to gain independence from existing employers. In some cases, they attempt to be innovative immediately with their first products. Often however they work on established and incrementally innovative IP from publishers.

Our analysis of published postmortems and ethnographic data on our three studios—Strategy Games, RPG Games, and Action Games—offers insights into how studios attempt to foster creativity within the constraints imposed by the rational influences of publishers and consumers. Table 2 presents the sequence of products and accompanying events at these three studios. As the studios move from one product to the next, they shift from innovative to less innovative games, or vice versa. In particular, Strategy Games and RPG Games backtracked

Table 2 Evolution of Studios in the Ethnography and Sequence of Products Developed

	Action Games	RPG Games	Strategy Games
Origins of the firm	Started out as a spin-off of a publisher's internal development studio (by former employees). Leveraged its programming (technology) competency.	Started out as a spin-off from another studio. Leveraged its experience in making RPG games as well as in content IP creation (e.g., good stories etc.).	Started out as a spin-off of a publisher's internal development studio. Leveraged its experience in making city-building games.
First product	Worked on third-party IP (incremental innovation); directly negotiated with comic book IP owner, then with publisher.	Sequel to a well-known game (incremental innovation) widely regarded for its gameplay; based on individual's vision.	Worked on own IP with combinative (gameplay, 3D) innovation that saw limited success; secured final funding from venture capitalist; based on individual's vision.
Second product	Worked directly for publisher sequel (project not completed).	Own IP (with combinative gameplay innovation) that became a success; individual and small group inspired.	Change (less innovation) Working on sequel to publisher IP using same game *engine* (defined as the core code); only reusing a subset of the first title's gameplay (i.e., the city-building aspects).
Third product	Worked on game with comic IP that publisher had rights to (incremental innovation).	Own IP (combinative innovation) (project not completed).	
Fourth product(s)	Change (more "content IP creation") Working on own IP; attempting to develop own IP and to market it to publishers, based on team member's proposal.	Change (less innovation) Worked on sequel to second product (incremental innovation that was partly self-distributed). Also worked on two sequels to publisher IP (incremental innovations).	

Source. Author's interviews and ethnographic cases.
Note. Combinative innovation refers to innovation that is more than incremental by combining features of two or more genres together to significantly change the gameplay or manner of interactivity.

with regard to innovation during subsequent game development; this backtracking was prompted by considerations such as the businesses' survival and the need to appeal to publishers' interests.

After Strategy Games' innovative first game came out in 2005, the studio found that some consumers of previous city-building games were confounded when their new game added a second layer or model—a society simulation—to the traditional city-building experience. As a result of that experience, Strategy Games' second product adapted only the city-building mechanics of its first product to a publisher's IP. The studio head further articulated what the studio had learned from that experience:

> The first thing is that I think a franchise name is much more important than people may want to admit.... It's already a big risk to strike out to make a new franchise. You're taking on a whole big challenge when you do that—a big challenge with publishers, a challenge with retailers.

He further reflected that "if I had to start over again, I might go to a publisher and say, 'Hey, you guys have that *Spell Force* game. We want to do a sequel to that [by adapting Strategy Games' game design].'"

RPG Games had a different experience. After developing two successful products (one of which was an innovation), it had to weather difficulties with false starts and one incomplete product, and sought to sustain itself with two incremental sequels based on publishers' requests. By their own admission, the sequel to their second game was also incrementally innovative, but helped them to reap more of the returns from the original IP that they had developed earlier. Interestingly, all three sequels that they worked on won accolades and awards even though they involved only incremental innovations: They enhanced gameplay as well as introduced compelling characters and stories that were similar to previously successful characters and stories from the original titles on which they were based.

Action Games began with a strong, albeit incrementally innovative, first product. However, the issue became not too much innovation, but rather too much publisher control over the IP. Despite its technical competence, Action Games had to cede a fair degree of control of its second and third products to publishers. One publisher wanted to dictate the game's design, and the other was concerned with onscreen representation of the IP. An additional issue was the studio's low visibility in the market because the publishers took most of the credit. For their fourth product, Action Games sought to develop their own unique content and to continue to build on their own programming code, which the studio head and employees believed might help achieve more bargaining power with publishers.

The issue of publisher control raises another extreme situation—where completed work is lost when contracts are cancelled. Two studios that we interviewed suffered when their publishers decided not to continue with the studios' nearly completed projects. As a result, all of the game design, code, and content was abandoned and largely not reused.

To circumvent these fates, other studios have tried to leverage IP in different ways. For example, a studio could attempt to become a publisher itself. This was the path successfully followed by Blizzard, which became part of Vivendi Universal's holdings. Two other studios in our interview sample tried a different strategy. Both focused on concept and pure IP creation for other interested parties, including film studios. This moved them upstream in the IP-value chain, making their strategies similar to those of the film industry.

Innovation requires studio lead designers to combine features from different games or genres, or to use other means to develop innovative gameplay. This is especially true of innovations that are more than incremental in nature. Innovations at Strategy Games and RPG Games were initially conceptualized by their respective studio heads. The innovative city-building game at Strategy Games combined two levels of simulation—a society simulation as well as a city-building simulation—in effect revamping the city-building genre. Similarly, the head of RPG Games noted, "We'll always bring to the table a big tool set with these RPG elements. However we take it to the first-person shooter genre so you can play with a different experience." In another combinative situation, concept brainstorming sessions at Action Games were observed to involve designers creating lists of features that would define their game.

The making of innovations or attempts to secure better terms may require that studios explore alternative funding and distribution paths to conventional publishers. With its first game, Strategy Games attempted to work with a venture capitalist–investor that wanted to enter the industry. However, Strategy Games eventually had to rely on an established publisher as well, because the venture capitalist lacked experience and capability in marketing and distributing games. RPG Games adopted a different strategy to bypass publishers by partly selling the sequel to its second product directly to consumers via the Internet.

4.4. Balancing at the Project Level by Tuning Designs and Repositioning Products

Even as studios attempt to foster or introduce innovation in their products, they have to be mindful that the games they develop suit their consumers' and publishers' needs. One way of balancing to help ensure a design's success is for teams to evolve games through the project development cycle by iteratively tuning and testing them. Such iterative tuning and testing for optimal play experience

ensures wider acceptance of the eventual product by consumers (Tschang 2005). In almost all the design meetings we attended at Action Games and Strategy Games, developers considered game features and details in view of consumers' expectations, and sought to fine-tune gameplay to meet perceived needs. In part, this was due to the intricacy of the games and the uncertainty of consumers' responses to design changes. Even in the somewhat incrementally innovative game *Rise of Nations*, which was a next-generation real-time strategy game, "we didn't know which [ideas] would work" (Train and Reynolds 2003, p. 36). Many teams use prototyping to help understand consumers' reactions to their games. Sometimes teams change designs because the initial designs do not work well, or because the designers want to make improvements. As a result of this uncertainty, some studios even adopt the alternative design philosophy of designing on the fly or as the game's development proceeds, as opposed to developing the full design upfront. There are also cases of major redesigns late in the product cycle: Despite having a nearly completed first version, the incrementally innovative *Half-Life* underwent a major overhaul at a late stage, which helped make it a great success (Birdwell 1999).

A second way of balancing at the project level is to reposition games and their designs expressly for (rational) marketplace concerns. As development proceeds, studios may make changes to the packaging (e.g., title and selling points) of the game, or to the design and content of the game, so as to satisfy potential publishers. In some cases, game developers need to reposition an innovative concept or game in development to find either an initial or a new publisher; in other cases, developers need to satisfy an existing publisher. For instance, the Strategy Games studio head and lead designers considered repositioning their innovative city-building game halfway through the development cycle to fit with new publishers and their market interests. The repositioning alternatives they considered ranged from changing the game's name to considering a different game with the same game engine, gameplay, and visual perspective. The latter would have entailed a completely different background and context—and, therefore, new art work, sound, and detailed designs. Ultimately, these developers stayed with the initial game and content. At least four postmortems also note the need to match ideas to publishers' expectations: The postmortem for *No One Lives Forever*, for example, states "the project mutated constantly in order to please prospective [publishers'] producers and marketing departments" (Hubbard 2007).

5. Discussion: The Studio's Balancing Act
Our discussion of industry data and events traced how the games industry has matured, and how interactions

among different industry actors and increasing rationalization within the industry have resulted in games that are increasingly incrementally innovative over time. Firms—particularly independent studios—have struggled to satisfy consumers' simultaneous but conflicting urges for novelty and familiarity, while conforming to the publishers' and market's rationalizing influence.

5.1. Balancing at the Firm and Project Levels

In general, studios perform a balancing act by shifting from innovative to less innovative products or vice versa. Sometimes, as with RPG Games, they go back and forth. Studios seek to innovate because they might want to test the innovativeness of a design, or to make a name for themselves beyond simply contracting work from a publisher. They innovate by developing their own original content, forms of gameplay, or both. Figure 2 represents this balancing behavior with a model of studios' decisions on product innovations. At the beginning of the design process, a studio chooses an initial level of innovation in gameplay terms. The decisions that follow, however, depend on whether the product becomes a hit.

A combination of these two factors—the extent of product innovation and the extent of success—yields three major types of product strategies, each with at least two states and two substrategies. In the first strategy of developing new genres, a hit might lead to an incrementally innovative sequel (e.g., *The Sims* was followed by many expansion packs, as well as by *The Sims 2*). However, if the product is not a hit, the designer may

continue to work on and refine the emerging genre. In the second strategy, success also dictates making similar but incrementally innovative sequels, especially if valuable content IP has been generated by the initial success (e.g., RPG Games' second product). If the game is not a hit, part of the innovative gameplay and code might be salvaged and reused with new content (usually consisting of well-known IP) in successive products (e.g., Strategy Games' second product). Depending on consumers' feedback, this might also involve simplifying gameplay. In other words, the studio tends to backtrack innovatively by retreating to a less risky application of its innovation. The third strategy involves starting out with incrementally innovative products. If these are hits, or at least provide contract work that can sustain the studio, the studio may take the option to continue to develop and introduce incrementally innovative products. A studio adopting such a strategy might also be sustaining itself until it can be in a position to innovate more substantially later (e.g., RPG Games' fourth products). If the incremental innovation strategy does not work, for instance, because it allows the publisher to dictate terms, a studio might try to innovate by creating more of its own IP and/or design innovations. In this way, the studio may gain more favorable bargaining terms with publishers, among other things (e.g., Action Games' fourth product). In summary, forces tend to push studios into performing balancing acts on innovation, regardless of their starting state of innovation.

Balancing can occur not only between projects, but also within a particular project as studios try to manage

Figure 2   Balancing Product Innovations Within Game Development Studios
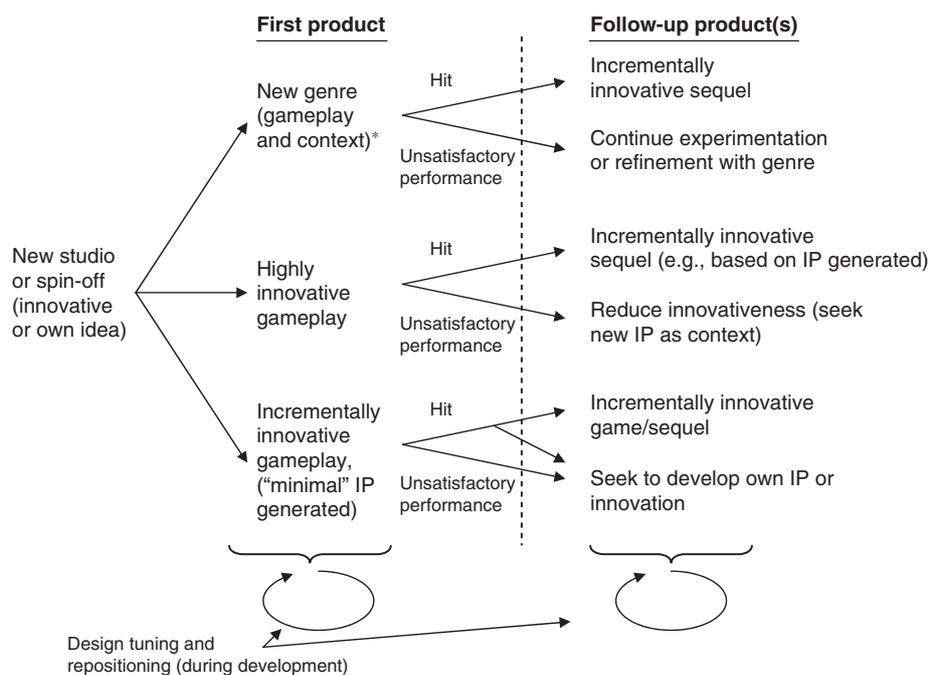
*Based on interview data.

uncertainty and adapt their products to the marketplace. Figure 2 shows the two mechanisms discussed earlier by which studios adapt designs to suit the marketplace: tuning and repositioning of innovations. Both tuning and repositioning can also be done for incrementally, as well as radically, innovative games. Both can also involve minor or major redesign.

5.2. Understanding the Phenomena

Our findings can be interpreted through various perspectives in the literature. The influence of rational forces on incremental innovation can be seen through the lens of institutional *isomorphism*, or the institutional forces that constrain organizations to resemble one another. Our findings on firms' balancing behavior adds to our understanding of how creative-rational tensions are resolved in creative industries, and our illustration of studios' product strategies and adaptive behaviors sheds light on the combinative nature of creativity in the industry.

Our study shows that rationalization in the games industry might involve studios and publishers making increasingly similar products, often with similar processes. An explanation for this organizational similarity may involve more than market mechanisms, and, in fact, our study may support an isomorphic explanation.[7] The desire of large publishers such as EA to influence independent studios with their processes and technologies is not unlike the coercive form of isomorphism, that is, the "formal and informal pressures exerted on organizations by other organizations upon which they are dependent" (DiMaggio and Powell 1983, p. 150). Cultural industry studies on nonprofit professional theatres (Voss et al. 2000) and Hollywood's film studios (Epstein 2005, Mezias and Mezias 2000) have also shown that the tensions between artistic and financial agendas are often resolved by the domination of one particular force—the pursuit of financial security and stability. As Epstein (2005, p. 107) notes of Hollywood's major studios, "The main task of today's studio is to collect fees for the use of the intellectual properties they control. . . . It is now essentially a service organization, a dream clearinghouse rather than a dream factory." In like fashion, game development studios have also paid overwhelming attention to their external constituents—publishers and consumers.

The notion of *mimetic isomorphism*, i.e., isomorphism due to uncertainty in the environment, also helps to explain the imitative behavior of the studios. The concept of ambiguity in goals and means (March and Olsen 1976) provides a rationale for this notion: "When goals are ambiguous . . . organizations may model themselves on other organizations." In this way, "uncertainty is also a powerful force encouraging imitation" (DiMaggio and Powell 1983, p. 151). The unpredictability of consumers' reception to new game designs (especially those that enable new forms of gameplay), and increasing product complexity, create significant uncertainty. The

tendency of independent studios to imitate or learn from one another partly results from their need to manage the risks of this uncertainty. The production of well-understood products that have immediate market interest is a related means of countering this problem. Furthermore, as outputs become similar—e.g., with the increasing dominance of immersive 3D games—the use of common scripting, graphics, and other software tools are becoming de facto parts of the process. This in turn is leading different firms to undertake similar tasks and routines as another way to combat uncertainty. Some idea of the importance placed on mutual learning can be seen by the popularity of the postmortems in *Game Developer* magazine as well as by the numerous conference sessions at the GDC that detail the lessons learned by studios on their projects.

Finally, the trend towards professionalization in the industry means that a normative form of isomorphism might be at work. At least some of the rationalization in the game development process appears to be similar in spirit to the rationalization trend in the computer software industry, which is now strongly influenced by the software engineering discipline (as developed by authors such as Chrissis et al. 2003 and Paulk 1995).

In summary, institutional characteristics can influence isomorphic behavior, which includes phenomena that occur at multiple levels, involves a variety of actors, and is caused by rational influences operating over long periods of time.

In seeking to move beyond the influence of rationalization and its effect on incremental innovation, studios also try to strike a balance between creativity and rationality. The issue of balancing creative with rational interests is analogous to the general organizational tension identified between explorative and exploitative processes (March 1991). Learning or technological change involves adaptation and a "delicate trade-off between exploration and exploitation," where exploitation involves the refinement and extension of existing competencies (March 1991, p. 85). Furthermore, this adaptive feature of organizations involves a tendency "to substitute exploitation of known alternatives for the exploration of unknown ones, to increase the reliability of performance" (March 1991, p. 85), presumably as a means of addressing the ambiguity that organizations face (March and Olsen 1976). Although this is largely described for the organizational level (March 1991), our study also illustrates such tensions occurring at multiple levels and across a variety of actors.

The issue of creative-rational tensions and the need to balance them has also been encountered in studies of other creative industries. As Lampel et al. (2000) note, novelty and familiarity are necessary ingredients for developing creative products, yet they create a tension because firms and other actors seeking to achieve both. For example, creative-rational tension occurs between commercial motivations and artistic license (Glynn

2000, Voss et al. 2000). A similar tension occurs between two types of authenticity: individual creative expression, and *manufactured authenticity*, defined as the rational attempt to craft an artist's persona to attract the attention of customers, critics, and others (Jones et al. 2005). Similarly, a game's design requires balancing the more rational interests of the market (e.g., tuning games to make them playable or usable by consumers) with the interests of developers in making a creative product. Publishers, too, have diversified their portfolios by contracting with external studios to make products that are more creative.

These tensions can be resolved in other ways. Resolutions are sometimes achieved by emphasizing either a dominant deliberate or emergent strategy. In the case of emergent strategies, "authenticity evolves and changes over time, requiring the feedback of and interaction among interdependent participants" (Jones et al. 2005, p. 897). Similarly, the adaptive behavior of game development studios, which involves creating and backing away from innovations, has an emergent quality. Other studies have also noted that such tensions are usually resolved by a balance or negotiation between the artists or creators and other stakeholders, as in the case of professional orchestra musicians confronting the rational business interests of the institution's management (Glynn 2000).

At the industry level, the balance between these conflicting interests may involve the creation of new firms, as shown with Mezias and Mezias's (2000) examination of the emergence of specialized film studios. This was also the case for the game development studios in our study, where the spin-off process allowed them to begin pursuing a more innovative path.

Creativity is a central instrument for individuals and firms to achieve greater returns through exploration, and more generally, in their search for balance in their efforts at innovation. Creativity underlies development of the next dominant designs, linking innovative behavior in the form of an organizational model of search and adaptation to the evolution and possible emergence of such designs. From our data, a potentially important creative mechanism for innovating or even adapting products is combining features from past games, a mechanism that we term *combinative creativity*, resulting in combinative innovations. The concept can be used at multiple levels. The idea of combinative capabilities was put forward by Kogut and Zander (1992, p. 392), who follow Schumpeter in thinking of innovations as "new combinations of existing knowledge and incremental learning." When operationalized, the term *combinative* may refer to the combination of ideas from one domain or industry with another through the sheer creativity of individuals and teams. This is not uncommon among leading product design companies (Hargadon 2003). At the cognitive level, combinative creativity is related to

constructivism, a philosophy of learning based on the premise that our understanding and representation of the world reflects our experiences. In games, constructivism involves cross-fertilizing ideas from previous games and other media, including books and films (Tschang and Szczypula 2006). We have further shown in this paper that these innovations can also arise from splicing gameplay and features from other games or genres to create a fusion product that may not closely resemble the gameplay of the constituent genres.

In the games industry, combinative creativity can lead to the refinement of genres' new dominant designs (i.e., genres) or products that in their culmination of features become the defining representatives of such genres. We have provided a basis for explaining how combinative creativity can enable a sequence of incremental innovations that may evolve into new genres or games that are definitive examples of new genres. An example of this is the *Grand Theft Auto* series, which evolved from a driving game with a *top-down view* (i.e., where the game is viewed from above, as in a map) to a 3D driving game (which gives a first-person view) that was lauded as a breakthrough product for its highly immersive nature and emergent gameplay (i.e., for the flexibility of play that it allowed users).[8] Combinative creativity may be a fundamental mechanism to be considered in terms of how technological trajectories and dominant designs occur. In fact, combinative creativity may weaken the influence of dominant designs because it can facilitate fusion products that are in-between dominant designs, as with RPG Games' second product. It may even extend the life of a dominant design, as seen in the extension of the RTS genre's popularity through the use of 3D technology. These insights might provide a basis for formulating an alternative means to conventional models (such as the product innovation-to-process innovation model [Utterback 1994]) for understanding how industries evolve. The manner in which combinative mechanisms shape industry evolution could be further researched. The combinative creative mechanism is analogous to the recombinative form of evolutionary change based on genetic cross-over mechanisms as seen in complex adaptive systems (CAS) modeling approaches (Axelrod and Cohen 1999, p. 23). CAS approaches could thus be suitable for further investigating how the adaptive and creative behaviors of firms are related to the evolution of designs and dominant designs.

To make sense of the relationships between the different actors and forces in the games industry, it can also be useful to investigate the commonalities within the class of structuration models. In particular, the use of technology could be institutionalized in an organization's practices, thereby limiting the potential creativity of users (Orlikowski 1992). The situation we observed in the games industry can be viewed as structuration occurring at multiple levels: An aversion to innovation

may emerge as a norm when consumers and publishers become familiar with certain genres, and when studios become familiar with the production of those genres. However, as our study points out, this is balanced by the inherent desire of individuals to be creative, and the need to meet consumers' demands for some level of innovation.[9]

6. Conclusions

Our objective in this paper was to explore how different forces interact at various levels as a creative industry evolves, and to study how the tension between creativity and rational influences is resolved. As the games industry has evolved, certain unique games have defined new genres, that is, dominant designs. Interactions among the industry actors—publishers, studios, and consumers—have reinforced a trend toward incremental innovations based on these genres. Recent criticisms of the lack of innovation in the industry suggest a growing awareness of this problem (Dobson 2006, Roch 2004). Tensions are created with this rationalization because consumers also expect innovative aspects in new games. The need for increasingly immersive games with detailed content will make it harder for studios to excel in all dimensions, i.e., to create innovative and enjoyable gameplay that responds to consumers who seek immersive experiences. A key challenge in the industry is the management of these tensions. Different actors accomplish this with a variety of balancing behaviors. Creative individuals are responsible for bringing about radical innovation, which results in new game genres. Recognizing this, some publishers seek more innovation by altering their portfolio to include successfully creative designers. Independent studios and their designers also balance creative and commercial interests by adapting their behavior with regard to product strategy (e.g., making their next products either more or less innovative, or shifting their focus to include creating their own IP), and by tuning and repositioning designs during projects.

In light of the uncertainty in this industry, strategies for initial success might be risky, especially for inexperienced teams. It may help firms to recognize that the process may involve balancing innovations and combinative creativity. To survive over the longer run, firms may need to be aware of the potential for innovation balancing strategies to help products evolve and succeed. These strategies also provide learning opportunities, e.g., how various kinds of combinative innovations can influence success. The "AAA" (i.e., highest production value and cost) titles such as *Grand Theft Auto 3* and *Sims 2*, both of which are sequels to innovative games, are examples of how the twin objectives of innovative gameplay and costly immersive qualities can be managed within successful product evolution strategies that may not have been dictated beforehand.

The risk-averse nature of many publishers also makes it difficult for designers to convincingly demonstrate new and innovative gameplay. The question is, at the industry level, can ladders containing progressive amounts of resources be made available to support a sequence of products, including their sequels, to improve new forms of gameplay, thereby attracting consumers? Firms may need to explore newer market niches where highly refined content is less important than providing innovative gameplay or unusual experiences.

Studios also need to manage a variety of other factors including internal resources, externally available resources (which are mostly controlled by publishers), and other objectives such as the perceived need to produce immersive polished games. One issue for further study would be whether other models exist that can effectively build internal capability that could be connected to external resources while minimizing risks. Another potential area of research involves whether the building of particular capabilities and resources helps differentiate studios from one another, and whether the mix of these capabilities and resources constrains or helps studios as they develop and evolve a sequence of products.

Finally, we might ask whether current institutions and incentives are optimal for promoting innovation, or whether new institutions or intermediaries with different incentives and different risk-mitigating behaviors are needed, e.g., publishers that act more like venture capitalists, or better online distributional models that fund and create game industry versions of the long-tail business models currently seen in some film- and Internet-content industries (Anderson 2006).

Endnotes

[1]We use the term *creativity* as a general term referring to both the output (with unique and interesting qualities) and the activity (i.e., creative thinking) that generates the output. Also, we consider creative output and thinking to be the same as innovative output and thinking.

[2]Technically, the term *video games* refers to console games, i.e., games played on consoles such as Sony's Playstation, Nintendo's GameBoy, or Microsoft's Xbox. In this paper, however, we use video games (or games) to refer to both console games and to so-called computer games (i.e., those played on personal computers).

[3]All interviews were conducted in confidentiality, and the names of interviewees are withheld by mutual agreement. Most of our interviewees were developers of computer games, although several interviewees (and one studio on which an ethnographic study was developed) made console games.

[4]The four firms—Action Games, RPG [role-playing games] Games, Strategy Games, and IGF-Winner—were given fictional names that reflected their primary characteristic (e.g., the typical genre of game that they made). All other studios in the paper are referred to by their actual names.

[5]Likewise, Will Wright's first big success—*Sim City*—was a city-building simulator/strategy game known for its sandbox kind of open-ended, goalless type of play. He was inspired as he toyed around with a scenario editor for another game, and discovered that he had more fun building things onscreen than tearing them down; he then combined this with models from Jay Forrester's studies on system dynamics (Rouse 2001). Similarly, *The Sims* was created by Wright after he spent two years researching books from architecture and other fields; he first attempted to make an architectural simulation, but this became more fun to play with as a virtual doll house. Another example is that of Chris Crawford, who has labored for more than 20 years to build his interactive storytelling technology. An early prototype appeared as *Siboot*—a game partly stemming from his ongoing research at Atari into components of interactive storytelling, but that was actually stimulated in a flash of insight by a tragic event—the agonizing death of a pet.

[6]*Level design* is the practice of plotting paths through or creating scenarios for segments of the game that the consumer must traverse in the course of playing.

[7]Over the course of our interviews, studio heads hardly ever discussed the conditions of competition or notions of competitiveness. Nevertheless, there is some element of competition in the market. Thus, alternative views to isomorphism might involve rational or market mechanisms (see DiMaggio and Powell 1983 for a discussion). Bounded rationality forms of decision making may also factor in the industry (March and Olsen 1976, Simon 1979). For instance, publisher behavior that categorizes games and seeks new titles according to their genre could be a form of heuristic-based behavior. However, given the evidence we have presented, it is unlikely that these are the main reasons for the similarity seen across organizations. The industry's behavior toward innovations is more likely to be a complex combination of rational and isomorphic factors.

[8]Other examples come from the games that have become definitive representatives of new genres. When traced, these games appear to have their lineage in predecessors that contained significant elements of their gameplay, but which did not capture the genre in as definitive a way as these games. Examples of this include the definitive first-person shooter *Wolfenstein 3D* and real-time strategy game *Dune II*. Writers feel that the first instance of specific real-time strategy gameplay (i.e., containing "harvest [resources], build [buildings], conquer [opponents]" actions, all performed in real time) appearing was in the console title *Herzog Zwei*. This predated the 1992 *Dune II* by three years. However, elements of real-time strategy appeared even further back in other games, such as *The Ancient Art of War* in 1984. Whether and to what extent these games influenced the designers of *Dune II* is an open question, but *Dune II's* designers did play many of these earlier games.

[9]Other related approaches that may be structurally appropriate for mapping onto the models in this paper include frameworks that permit the incorporation of multiple frames or perspectives (e.g., Orlikowski and Gash 1994) and multiple levels of analysis in a structuration model (DeSanctis and Poole 1994).

References

Abernathy, W. J., J. M. Utterback. 1978. Patterns of innovation in industry. *Tech. Rev.* **80**(7) 40–47.

Anderson, C. 2006. *The Long Tail: Why the Future of Business Is Selling Less of More*. Hyperion, New York.

Anderson, P. C., M. L. Tushman. 1990. Technological discontinuities and dominant designs: A cyclical model of technological change. *Admin. Sci. Quart.* **35**(4) 604–633.

Axelrod, R. M., M. D. Cohen. 1999. *Harnessing Complexity: Organizational Implications of a Scientific Frontier*. Free Press, New York.

Baba, Y., F. T. Tschang. 2001. Product development in Japanese TV game software: The case of an innovative game. *Internat. J. Innovation Management* **5**(4) 487–515.

Bethke, E. 2003. *Game Development and Production*. Wordware Publishing, Plano, TX.

Birdwell, K. 1999. The cabal: Valve's design process for creating half-life. http://www.gamasutra.com/features/19991210/birdwell_01.htm.

Caves, R. E. 2000. *Creative Industries: Contracts Between Art and Commerce*. Harvard University Press, Cambridge, MA.

Chey, J. 1998. Irrational Games' *System Shock* 2. *Game Developer* **6**(11) 52–59.

Chrissis, M. B., M. Konrad, S. Shrum. 2003. *CMMI: Guidelines for Process Integration and Product Improvement*. Addison-Wesley, New York.

De Vany, A. 2004. *Hollywood Economics: How Extreme Uncertainty Shapes the Film Industry*. Routledge (Contemporary Political Economy), Oxford, UK.

DeMaria, R., J. L. Wilson. 2002. *High Score! The Illustrated History of Electronic Games*. McGraw Hill, Osborne, Berkeley, CA.

Department for Culture, Media and Sport (DCMS). 1998. *Creative Industries Mapping Document 1998*. Department for Culture, Media and Sport, London, UK.

DeSanctis, G., M. S. Poole. 1994. Capturing the complexity in advanced technology use: Adaptive structuration theory. *Organ. Sci.* **5**(2) 123–147.

Crawford, C. 2003. *Chris Crawford on Game Design*. New Riders Games, Berkeley, CA.

DiMaggio, P. J., W. W. Powell. 1983. The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *Amer. Sociol. Rev.* **48**(2) 147–160.

Dobson, J. 2006. Indie developers on how to fix the game biz. Industry News, Gamasutra. http://www.gamasutra.com/php-bin/news_index.php?story=10643.

Donovan, T. 2004. Top 20 publishers in games. *Game Developer* **11**(9) 10–18.

Eisenhardt, K. M. 1989. Building theories from case study research. *Acad. Management Rev.* **14**(4) 488–511.

Eisenmann, T. R., J. L. Bower. 2000. The entrepreneurial M-form: Strategic integration in global media firms. *Organ. Sci.* **11**(3) 348–355.

Electronic Arts (EA). 2005. *10-K Filing.* Securities and Exchange Commission, Washington, D.C. (June 7, 2005).

Entertainment Software Association. 2005. Essential facts about the computer and video game industry. Entertainment Software Association, Washington, D.C.

Epstein, E. J. 2005. *The Big Picture: The New Logic of Money and Power in Hollywood.* Random House, New York.

Gallagher, S., S. H. Park. 2002. Innovation and competition in standard-based industries: A historical analysis of the U.S. home video game market. *IEEE Trans. Engrg. Management* **49**(1) 67–81.

Glaser, B., A. Strauss. 1967. *The Discovery of Grounded Theory: Strategies of Qualitative Research.* Wiedenfeld and Nicholson, London, UK.

Glynn, M. A. 2000. When cymbals become symbols: Conflict over organizational identity within a symphony orchestra. *Organ. Sci.* **11**(3) 285–298.

Hargadon, A. 2003. *How Breakthroughs Happen: The Surprising Truth About How Companies Innovate.* Harvard Business School Press, Cambridge, MA.

Henderson, R. M., K. B. Clark. 1990. Architectural innovation: The reconfiguration of existing product technologies and the failure of established firms. *Admin. Sci. Quart.* **35**(1) 9–30.

Hirsch, P. M. 2000. Cultural industries revisited. *Organ. Sci.* **11**(3) 356–361.

Hubbard, C. 2007. Postmortem: Monolith's *No One Lives Forever.* http://www.gamasutra.com/features/20010608/hubbard_01.htm.

Jones, C. J., N. Anand, J. L. Alvarez. 2005. Manufactured authenticity and creative voice in cultural industries. *J. Management Stud.* **42**(5) 893–899.

Keighley, G. 1998. Simply divine: The story of *Maxis* software. *Game Spot.* http://www.gamespot.com/features/maxis/.

Klepper, S., K. L. Simons. 2000. Dominance by birthright: Entry of prior radio producers and competitive ramifications in the U.S. television receiver industry. *Strategic Management J.* **21**(10–11) 997–1016.

Kogut, B., U. Zander. 1992. Knowledge of the firm. combinative capabilities, and the replication of technology. *Organ. Sci.* **3**(3) 383–397.

Kushner, D. 2003. *Masters of Doom: How Two Guys Created an Empire and Transformed Pop Culture.* Random House, New York.

Lampel, J., T. Lant, J. Shamsie. 2000. Balancing act: Learning from organizing practices in cultural industries. *Organ. Sci.* **11**(3) 263–269.

Leonard, T. 1999. Looking glass's *Thief*: The dark project. *Game Developer* **6**(7) 50–58.

Lincoln, Y. S., E. G. Guba. 1985. *Naturalistic Inquiry.* Sage Publications, New York.

March, J. G. 1991. Exploration and exploitation in organizational learning. *Organ. Sci.* **2**(1) 71–87.

March, J. G., J. P. Olsen. 1976. *Ambiguity and Choice in Organizations.* Universitetsforlaget, Bergen, Norway.

McDonald, D. 2005. Hollywood to EA: Bring it on. *Wired Magazine* (August).

Mezias, J., S. Mezias. 2000. Resource partitioning and the founding of specialist firms: The American feature film industry, 1912–1929. *Organ. Sci.* **11** 306–322.

Miles, M. B., A. M. Huberman. 1994. *Qualitative Data Analysis.* Sage, Thousand Oaks, CA.

Orlikowski, W. J. 1992. The duality of technology: Rethinking the concept of technology in organizations. *Organ. Sci.* **3**(3) 398–427.

Orlikowski, W. J., D. C. Gash. 1994. Technological frames: Making sense of information technology in organizations. *ACM Trans. Inform. Systems* **12**(2) 174–207.

Paulk, M. C. 1995. *The Capability Maturity Model: Guidelines for Improving the Software Process.* Addison-Wesley, Reading, MA.

Pham, A. 2002. Consolidation seen among game firms. *Los Angeles Times* (Oct. 7).

Pritchard, M. 2000. Ensemble Studios' Age of Empires II: The Age of Kings. *Game Developer* **7**(1) 52–58.

Reinhart, B. 2000. Epic Games' Unreal Tournament. *Game Developer* **7**(5) 46–58.

Robins, J. A. 1993. Organization as strategy: Restructuring production in the film industry. *Strategic Management J.* **14** 103–118.

Roch, S. 2004. The new studio model. Gamasutra. http://www.gamasutra.com/features20041029/roch_01.shtml.

Rogers, D. L. 2004. The end game: How top developers sold their studios, Part 1. http://www.gamasutra.com.

Rouse, R. 2001. *Game Design: Theory and Practice*, 2nd ed. Wordware Publishing, Plano, TX.

Salen, K., E. Zimmerman. 2003. *Rules of Play: Game Design Fundamentals.* MIT Press, Cambridge, MA.

Schilling, M. A. 2003. Technological leapfrogging: Lessons from the U.S. video game console industry. *Calif. Management Rev.* **4**(3) 6–32.

Simon, H. A. 1979. Rational decision making in business organizations. *Amer. Econom. Rev.* **69**(4) 493–513.

Spector, W. 2000. Ion Storm's Deus Ex. *Game Developer* **7**(11) 50–58.

Starkey, K., C. Barnatt, S. Tempest. 2000. Beyond networks and hierarchies: Latent organizations in the U.K. television industry. *Organ. Sci.* **11**(3) 299–305.

Sternberg, R. J., ed. 1998. *Handbook of Creativity.* Cambridge University Press, Cambridge, UK.

Stojsavljevic, R. 2000. Westwood Studios' Command & Conquer: Tiberian Sun. *Game Developer* **7**(2) 46–54.

Train, T., B. Reynolds. 2003. Big Huge Games' Rise of Nations. *Game Developer* **10**(7) 36–41.

Tschang, F. T. 2005. Videogames as interactive experiential products and their manner of development. *Internat. J. Innovative Management* **9**(1) 103–131.

Tschang, F. T., J. Szczypula. 2006. Idea creation, constructivism, and evolution as primary characteristics in the video game artifact design process. *European Management J.* **24**(4) 270–287.

Utterback, J. M. 1994. *Mastering the Dynamics of Innovation.* Harvard Business School Press, Cambridge, MA.

Voss, G. B., D. M. Cable, Z. G. Voss. 2000. Linking organizational values to relationships with external constituents: A study of nonprofit professional theatres. *Organ. Sci.* **11**(3) 330–347.

Yin, R. K. 1994. *Case Study Research: Design and Methods*, 2nd ed. Sage Publications, Thousand Oaks, CA.