Chapter 30

Coin-Op: The Life (Arcade Videogames)

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Introduction

Dollar volume is the yardstick by which I measure success in pop culture. My focus is the Coin-Operated Arcade videogame—"Coin-ops" for short—and the entertainment that addicts its core audience, 14-year-old males. It is an unusual profession in quest of an evasive product: the "kick-ass hit." The challenge is matched by the reward when success visits. Coin-op regularly allows a relatively small group of people with a strange array of talents to create content that can change pop culture.

Coin-op and its larger consumer shadow have a considerable economic effect. Over the last five years, annual coin-op equipment sales in the United States averaged around $150 million. The estimated U.S. cashbox (money collected from players) stands at about $2.5 billion per year. Domestic sales of consumer interactive entertainment software—videogames—is about $2.5 billion. When you add Japan, Asia, Europe, and all home ("console") videogames, people worldwide spend close to $20 billion annually on videogame entertainment. Videogames in all their guises are a major contender for our leisure time and money.

The industry that concerns itself with the design and manufacture of these devices has been my home since leaving school in the early 1980s. On my first product, I created graphics, animation, and code. I was the lead designer and pixel pusher on half a dozen later games; some met with success. My focus has changed since then—from how to design a great game to how to design an organization that enables designers to design great games. Over a decade of focus groups, field testing, talent hiring, design reviews, and game-selling has led me to some observations on the nature of the business. For the sake of simplicity, this chapter is largely concerned with the U.S. market, which represents about 50 percent of the global market. My intent is to familiarize the reader

with an industry that gets little coverage but has had a strong influence on modern entertainment.

Why the Coin-Op Arcade?

Coin-ops and their content—the games themselves—are the source of the lion's share of commercially successful electronic interactive entertainment product. The commercial origin of the videogame industry occurred in 1972 with a game called Pong. The revenue growth curve that ensued and ran unabated until 1982, the year of the video bust, was remarkable. At its peak in 1980–1981, annual coin drop exceeded $6 billion, the operator population hit an all-time high near 13,000 (it's now about 4,000), and Atari's annual revenues alone were pushing $2 billion—passing its parent, Warner Communication's Motion Pictures Group. Since then the consumer entertainment titles that began as arcade hits have historically been the biggest sellers. As measured by market size, the arcade videogame has had the greatest cultural influence of all interactive multimedia formats. Many of the games that originate on home platforms are based on a model that came from the arcade.

Of the $2.5 billion spent in 1996 on home videogame software, about 60 percent is spent on the top ten titles; 25 percent is spent on the top five. From 1990 to 1995, the majority of the five top-selling consumer titles were ports of arcade videogames. Original titles for the PC, like Duke Nukem, Warcraft 2, Doom, Civilization 2, SimCity 2000, and Myst, are making inroads, but the market volume isn't there. When it comes to electronic play, Americans and the world still look to the arcades and arcade-style games.

Over the past 25 years, coin-op games have collected over $125 billion in quarters. This is almost identical to the amount motion pictures reaped at the box office during the same period. Assuming each play cost 25¢ and lasted an average of 90 seconds, it represents about 1.4 million hours of actual gameplay. And it represents more development time, attention, and money devoted to this form than any other. Newer interactive media will evolve through many incarnations before they're visited with the same consumer acceptance as hit arcade properties. The craft of arcade videogames—techniques, products, and their effects—can take us far in understanding what many people want to experience in the more recent interactive entertainment offerings.

One reason coin-op titles find great public acceptance is that they're carefully tested before sale. Coin-op provides the most honest and responsive public acceptance test-bed of all interactive entertainment. When a beta version of a coin-op game is placed on location, we get an immediate and clear indication of whether we have a hot property within one weekend. The pay-per-play rule of thumb—25¢ for 90 seconds of game time—means a game can yield $10 an hour if it's in constant play. We know how good our game is by how close we come to that $10 an hour. If it yields well over the weekend, we're probably onto something. If it sustains good earnings over a week, we keep our fingers crossed. If the earnings are sustained over six weeks, we know we have a game.

When players first see the unit, we have to somehow convince them to pay money to touch and interact with a box. Then, without a manual or tutorials, our games have 90 seconds to convince players that they want to reenlist for another 90 seconds. Imagine how many conversations would be cut short if this were a requirement. We have a tremendous incentive to create an easy, effective human interface design in every coin-op game.

In other forms of interactive entertainment, this is not the case. With consumer software, customers, hyped by word of mouth and reviews in magazines in which game publishers advertise, pay their $50 up front for the box of entertainment. No one really knows how many hours the game is played, if at all, once it leaves the store. The meter is always on for coin-op; we know the state of our appeal at any given time. This is why properties that have been successful in coin-op do well in the home. They're play-tested with a paying public.

How the Industry Works

The Manufacturer

The cycle begins with an unholy marriage of publisher and author. Hardware manufacturers like Atari, Capcom, Konami, Namco, Midway, SNK, and SEGA hire creative people to design games for them to build in their factories. These games take four months to four years to develop, at a cost of $500,000 to $5 million. The design teams' work is a melding of creativity, craft, and cost-effective technology.

After plenty of meetings, hallway conversations, focus groups, and field testing of a new game design, the manufacturer risks millions of dollars on parts and sets out to build the game. A typical upright game costs the manufacturer about $2,000 to build. When it goes into production, the manufacturer's sales team starts booking orders with the scores of distributors that serve as a combination of sales force, parts and service, and operator financing. Distributors commit to purchasing games by the shipping-container full (20 to 40 games per container) and buy them for $3,200 to $13,000 each. Manufacturers make all of their profit in the margin between the gross cost to develop and build the game and the price at which the distributor purchases it.

The Distributor

There are about 40 distributors in North America. Each maintains a sales force, a showroom, a financing department, a maintenance department, and a keen sense of what constitutes a good game. They sell the games to local operators. The average price to them is "out the door" on the operator's pickup truck at just under $4,000, tax and licensing included. The distributor profits from a combination of the markup on the price of the game, financing, and maintenance fees. As the business stands today, financing is a key element in this equation.

The Operator

Most operators have been in the business between 10 and 20 years. Each typically has a route that includes both arcades and street locations. Most also operate pool tables, jukeboxes and cigarette machines. A new game starts out at the operator's highest-grossing locations. Operators gradually rotate a new game between all of their locations in order to most quickly earn back, one quarter at a time, the money they spent on the game. There are three classes of operator locations: Family Entertainment Centers (FECs), arcades, and the "street."

At the operator's best location, one of his or her three arcades, a hot new game will earn $400 to $700 a week. After 8 to 12 weeks, its earnings rate will have tapered to $250, at which point the operator might move the game to one of 10 to 20 street locations. The owner of the street location supplies the floor space, electricity, and customer traffic, while the operator supplies the game and maintenance. They split the weekly cashbox. Games in these locations don't earn as much, but since the operator has already recouped the outlay in the arcade, any additional revenue is profit. Besides, the operator needs places to store all of the old "wood."

. . . Meanwhile, Back at the Manufacturer

The manufacturer, owner of a now-proven hot property, will have begun work on the home versions by paying outside developers about half a million bucks to squeeze the graphics and code of the original design into a Nintendo or SEGA cart or a Sony or PC CD-ROM. This is where the real money is made. A hot design that sells 10,000 arcade units in the United States will gross about $30 million for the manufacturer. And it's almost guaranteed to then sell one to

four million units of the home version at $25 to $40 wholesale, for a gross of $25 to $100 million per title.

The bucks don't stop there, either. The best games will trigger action figures, comic books, trading cards, pajamas, Saturday morning cartoons, and even a movie. But, don't quit your day job yet. Fewer than one in three of the games that start development see even an average production run of 4,000 units, and a game with an average production run is barely a break-even proposition for the manufacturer. Like a gambler, the manufacturer only remembers the big wins that carry them through the down cycles—make no mistake; it's a hit-driven business.

The Locations (and Their Customers)

The "Street"

The Street consists of locations where the primary business is something other than arcade entertainment. Convenience stores, pizza parlors, bowling alleys, and bars are typical. There are between 60,000 and 80,000 street locations operating videogames, each with fewer than ten units. Customers at these locations are a combination of whatever spill-over happens from normal traffic, coupled with the locals who hang out by the games. To the site owners, it's an opportunistic use of a few square feet and just a part of their product mix—one that doesn't need much attention. Average weekly take on machines at these locations is about half of what the same games could make at an arcade or FEC. Street locations constitute over 60 percent of the market of standard upright releases. The manufacturer has to penetrate sales of new units to the Street to have enough volume for a true hit.

The Arcades

This is the home of our target demographic, 14-year-old boys. The second ring of the bull's-eye includes males, ages 12 to 22; currently, nobody else matters. Neighborhood arcades contain 20 to 50 machines, with most of the newest, coolest, expensive ones often positioned near the back. Operators provide several game types—for variety to the core users and to provide something for casual customers to explore. There is also typically an array of prizes for players of the children's redemption games (the ones that emit tickets). Across the United States, there are now 10,000 to 13,000 arcades in operation; the total ebbs and flows with industry profitability. Weekly income ranges from $5,000

to $12,000 per site. Because of their greater traffic, these locations can afford the higher-priced ($5,000 to $15,000) pieces. Weekly cashbox collections run $95 to $200 per game, with the top ten games earning between $300 and $1,000.

The average American teenager who visits an arcade will go once or twice a week with a small group of friends. He spends $5 to 10 per week, half on new hot games. The rest is spent on his favorites—he can win longer playtimes. The extreme version of this demographic, the game addict, puts as much as $50 per week into his favorite games. Hard-core gamers constitute about 5 percent of the clientele at an arcade. Because of their skill, they get longer gametimes, and, in the case of fighting games (winner stays/loser pays), they can play quite a while for "free"—though they spent plenty to become that good. These are the trendsetters in the arcades, determining what's hot and what's not. The other players part with coin to beat them and their scores. Arcades themselves are now differentiating; many will continue to match the description just given, while a new, high-end arcade experience is beginning to show up in the choicest sites.

The Family Entertainment Centers

FECs attract the typical arcade crowd but add to it young families (casual players). Arcade devices are just a part of these large sites, which have a wide range of diversions, plus food and beverage. Laser tag, miniature golf, and go-karts were some of the elements used to form early FECs; sites are now designed from the ground up and provide a carefully tuned array of leisure activities. These locations must be located within easy access of large populations. Within this group are the "national accounts," owned by larger companies like Dave and Buster's, Discovery Zone and Wonder Park. Some sites are owned by the manufacturers, which is a way for them to make revenue beyond equipment sales.

A well-managed center in a top location can justify outlays for the most expensive, deluxe, sit-down arcade systems, and is a step toward the fabled LBE. These typically include motion-base simulator systems, often thought of by the public as "VR." VR pieces almost never make back the initial investment; they're used as attractions to lure the casual player in much the same fashion as the carny barker on the circus midway. FECs also have linked multiplayer games like the eight-seat Daytona USA and San Francisco Rush driving games. Some of the top sites like SEGA City at the Irvine Spectrum Entertainment Center in California, the Trocadero in London, Fort Lauderdale's Grand Prix, and Wonder Egg in Tokyo, with their rows of big-screen games, indoor bumper cars, and real Mazda Miatas, are entertainment spectacles in themselves. There were about 2,700 FECs in operation in 1996.

Where Those Boxes Came From

The birth of arcade videogames can be traced to 1962. At that time, there were only four places on the entire planet that had a CRT hooked up to a computer: Stanford, MIT, Carnegie-Mellon, and the University of Utah. The first videogame was designed by an MIT student, Steve Russell, who created "Space War!" as "a personal project for his own entertainment." A kid named Nolan Bushnell was attending the University of Utah about then.

Fast-forward a few years. In 1970, two Ampex employees, Nolan Bushnell and Ted Dabny (who chipped in $500), were joined by Ted's brother John and formed a game development company called Syzygy. This group created a game called "Computer Space," a scaled-down version of Russell's 1963 game Space War!, on what amounted to a discrete logic PC. The California coin-op firm Nutting Associates marketed it; it debuted at the MOA show in the fall of 1971 and reportedly sold 3,000 units. This game—created in Bushnell's daughter Britta's bedroom, which he had converted into a lab—was the first commercially available Coin-Op.

Syzygy continued to develop other games. Nutting retained Syzygy to produce a two-player version of Computer Space. At the same time, Bally retained the company with a $25,000-a-month contract. It was then that Bushnell approached Al Alcorn and asked him to create a game based on his new concept based on two paddles and a ball; Pong was born. Debate still rages over who invented Pong. Magnavox publicly showed the first home videogame console, the Odyssey, on May 3, 1972, in Phoenix, Arizona; it played a game with two "paddles" and a "ball." Though Bushnell claims he didn't attend that event, Atari later did settle out of court and ended up paying royalties to Magnavox. Bushnell created two prototypes of Pong: one with a coin mechanism and one for a demo at Bally in Chicago, where Bushnell intended to convince Bally (and the recently acquired Midway) to take Pong instead of the driving game he had been contracted to deliver. The other unit went into a bar called Andy Capp's on El Camino Real in Sunnyvale, California, and four hours later the bread loaf tin they had rigged as a cashbox was overflowing. People were waiting to get in when the bar opened the next morning. Al Alcorn immediately called Nolan with the news, and Nolan called off the Bally deal. Within a few weeks, Syzygy built the first ten units with orange cabinets. The rest is history.

Very Early Games

The roots of videogames, however, reach much further back. The electronic interactive entertainment market is based on competitive games that predate the harnessing of electricity. Games involved territory, dominance, and hand-eye

coordination: aboriginal hunting games, board games, target games, and bowling games. The fundamental compelling features remain in arcade games of today. As a result, the market of electronic interactive entertainment is male-dominated; I leave questions related to this phenomenon and whether it was, is, and always will be mostly a "guy thing" to others. Technology itself, for a variety of reasons, is mostly a male thing. What needs to change before this changes? Will it ever change? Perhaps only guys are stupid enough to care who wins such games (let alone spend countless hours getting good at them).

Games in early cultures served valuable purposes beyond entertainment. As children, we learn through playing games; simulating battle against other creatures or humans was a vehicle for practicing hunting and survival skills. Satisfying basic human yearnings for an arena in which to act out competitiveness and violence has much to do with the content themes of today's arcades.

As things became more civilized, games evolved into parlor room versions—simulations—of the aboriginal games. Go, chess, Parcheesi, and backgammon simulated battles over territory. Aiming games like bocci ball, Pataank, marbles, and darts have roots in spear and arrow hunting games. Games became a leisure activity instead of practice of survival skills for later in life; mastering a game could be an end in itself.

Games are an excuse for people to spend time together. Within that social setting, there is often a desire for establishing dominance over another individual or group. Dominance is established within a defined set of rules, via mastery of the skills that best address the rules. Each player's territory (resources of some kind) is defined at the start; winning is about establishing dominance through laying waste to the other player's territory. If this sounds too aggressive, consider your favorite game. Even a crossword puzzle involves claiming the territory of all of the open spaces that the puzzle's design "possesses." Arcades have become a major contemporary theater for adolescent males to act out the same impulses that caused aboriginal gaming to exist.

Publicly demonstrating that one possesses the skills necessary to deal with violence (real, fantastic, simulated, or implied) is still important in the socialization process. While children no longer need to learn hunting skills, it seems their hind brains have an unquenchable desire to define individual accomplishment. Successful arcade games play into this need for a clear definition of dominance.

Roots of the Arcades: Pageants, Festivals, Carnivals, Fairs, and Circus Midways

In Western culture, the religious festivals associated with Spring, like Osiris in Egypt, the sixth-century B.C. celebrations in Athens honoring Dionysus, and the Roman festivals of the Bacchanalia, Saturnalia, and Lupercalia, were large

gatherings of ribald merrymaking, masquerades, and pageants. In northern Europe, pagan carnivals reached their peak in the 14th and 15th centuries. Unable to stamp them out, the church had to accept many of them. Under Catholicism, the original carnival landed on Shrove or Fat Tuesday, the day before Ash Wednesday and the beginning of the season of penance known as Lent.

In the 1800s, the term "carnival" became more associated with local festivals and traveling circuses. With its roots in the circuses of ancient Rome, where chariot races and other events took a toll on Christian participants, the modern circus was born in the closing years of the 18th century. By 1830, traveling circuses with equestrian shows were common in Europe and the United States. After 1869, the three-ring circus emerged with its wide variety of entertainment. Since crowds with leisure time and cash in their pockets were drawn to these events, sideshows and the games that became known as the Midway sprouted around the main tent. Then, clever entrepreneurs added other skill-based attractions and ride devices like swings (flight simulators) and merry-go-rounds (simulators of the equestrian events in the main tent, which were simulating the equestrian events of the Romans). Even the advanced simulation products in arcades are descended from ancient Rome.

Midways became the haunt of the quick-play, cheat-you-fair games of "skill" and chance that taunt players to prove themselves in front of others. All these leisure playgrounds encourage individuals to publicly display gaming prowess. Carnival midways are interactive challenges presented in a way that makes one internally comment, "Oh, I can do that!"—precisely what an arcade game's attract mode must do. Important in these carnival roots is the concept of the owner charging a fee per play, renting time on an experience.

Nickelodeons and Slot Machines: The Automation of Diversions

Turn-of-the-century boardwalks and main streets were the birthplace of automated devices selling entertainment and/or prizes in pocket-change portions. Though the Greek scientist Hero created what may be the first coin-operated vending machine (it dispensed holy water in return for a five-drachma coin), the slot machine, kinescope, and nickelodeon of the late 1800s comprised the first widespread exploitation of the concept of automated pay-per-play entertainment. The term "nickelodeon" derives from the nickel or coin that triggers the event and the Greek root "odeon," or play—play for a coin. It came to be used as the name for the public venue that held the machines. The Slot Machine, as we know it, first appeared in San Francisco in the 1890s as a poker machine, which usually paid out in cigars or bar drinks. Other mechanical devices activated actual instruments that played popular songs of the day, the

forerunners of the jukebox. Coin-op arcades are the direct progeny of nickelodeons.

The Pinball Game

Pinball was the final link; the pinball machine triggered the entree of automated devices selling entertainment in pocket-change portions to the street. Unlike slot machines, the only prize with pinball was more game time (though many locations made under-the-table payoffs). While slot machines were relegated to unsavory locations like bars and pool halls, now more wholesome venues with wider audiences, like restaurants, dry goods stores, and soda fountains, could operate these stand-alone units. Early pinball games like Bagatelle (1871) and Log Cabin (1902) led to the unprecedented success of Ballyhoo in the 1920s and other silver-ball games that loaded the cannon for the introduction of videogames. Finally, technologies like the microprocessor, light-emitting diodes, core memory, and affordable CRTs in the late 1960s triggered the videogame explosion in the early 1970s.

Content = The Game

The game is perceived through the player's visual, audio, and tactile senses and takes shape in the player's mind. The more sensory inputs that are (expertly) stimulated in the player, the more an enveloping game state is reinforced. Games that achieve The State within the player are the games whose effect approaches that of good music or, in Mihaly Csikszentmihalyi's term, "flow." Successful game design controls the player's blood pressure. It causes the player to spend small quantities of cash per minute in an intense exchange with a noisy object. To a game designer, it's the coolest thing on earth to achieve.

The range of themes is quite limited. They've evolved through simple public demand and acceptance. I believe they tap into the hind brain of the player. I believe the themes are linked and are a reflection of basic evolutionary survival drives. Adolescents, by definition, are just beginning to understand power in society yet are denied real access to it. videogames simulate the accessing of that power; they are cathartic power play. Representation of self as a small character against the larger on-screen environment that's out to kill the player resonates in the teen mind. Implications of the social context of the arcade are testosterone drenched. The arcade is a place to meet strangers and beat them up.

While development of new themes in interactive entertainment has heated up in the mid-1990s, none of the results have yet achieved broad commercial acceptance. Smaller companies with less overhead tend to experiment with

new themes because they require less return on investment, at least initially. If markets for these new themes are established, they will be pursued and refined by larger companies.

The craft of creating the games is largely an oral tradition. There are a few commercial schools that address all the skills necessary for this medium. It takes skilled workers, not just programmers or artists, to create a great piece. For the most part, the manufacturers' employees possess the core competencies necessary to create successful videogames. These companies must attract, educate, and provide technology for scores of designers before the true artists rise to the top. A designer capable of multiple successes is rare indeed, and the target of every development house. Having that talent at the right time with the right technology is even harder. It takes a confluence of individual skill, technology, market timing, and luck to create a successful arcade videogame.

History of Content Creation

The Early 1970s

The first games were just discrete logic hardware. The only designer was the person who laid out the printed circuit board. Graphics consisted of matrices of diodes laid out on big printed circuit boards in the shape of the graphic as it appeared on the screen. Development teams consisted of a hardware guy and a technician, and development time for games took anywhere from one week to three months.

The Late 1970s

With the advent of the microprocessor and its increasing complexity, it became necessary to have a software guy. At first, much of the software guy's role was to blame the bugs on the hardware guy and vice versa. Graphics were created in hexadecimal machine code translated from blocky drawings on graph paper. As things progressed, it became more of a software effort—the programmer/designer became more powerful. In addition to the programmer, there was usually a dedicated technician and about half a hardware guy. Development times crept up to six months.

The Early 1980s

Artists step to the fore. Somewhere around 1980, as EPROM (electronically programmable read-only memory) storage capacities went up and prices went down, graphics became important. You still needed great moment-to-moment

play, but now you also needed great graphics. Color monitor displays increased the need for artists. At the same time, game companies began creating their own custom chips. The graphics that were once diodes on circuit boards, then hex digits, now were being created with software paint tools that clumsily simulated paintbrushes and erasers. Teams included hardware, software, and graphics experts. With the first audio synthesis chips, it became necessary to hire musicians, but then, as now, a project didn't require a full-time audio person. By this time, there was also strong motivation to outdo the home systems; they had begun to seriously hurt arcade attendance. Many games took up to a year to complete.

The Late 1980s

Things only got more complex. Teams still had a hardware person, but now, because of complexities in creating custom chips, there were families of hardware that would be used for more than one game. There was still one programmer per project, but, due mostly to larger storage capacity and higher bit depth, game teams needed two to four artists to create a competitive title. Videogame manufacturers' R&D groups were creating the world's most powerful low-cost graphics chips.

The 1990s

With the rush to invest in multimedia, companies like Sony, SGI, and start-ups like 3Dfx began creating custom graphics chips for the promising future. With tens of millions of dollars being spent on new chip designs, arcade manufacturers found it difficult to compete. Alliances were formed: Sony with Namco, SEGA with Martin Marietta, SGI with Nintendo. Faster processors, more RAM, bigger EPROMs, and hard disks created a voracious appetite for code and graphics. Teams of two or more programmers became common (Japanese teams can have eight or more). Four to six dedicated artists have become the norm, with additional graphics folks handling video processing, stop motion, and motion capture. Budgets now run between $2 million and $4 million in development costs.

Rules of Game Design: Pierce's Top Eleven Gameplay Attributes

In nearly 20 years of experience playing, creating, and managing the creation of videogames, I've identified the following critical attributes. It is essential for a coin-op videogame to possess each of them. Don't leave the lab without them:

1. The game must be visually compelling; it must serve as an automated carny barker in a box. Its presentation—the attract mode—must be aurally and visually compelling—and clear enough to attract passersby (read: suckers). Because it's an element of pop culture, it must look and sound cooler than what has come before. The game must instantly inject the thought "I can do that!" in the player's head.

2. The game must involve the idea of death—of the player's proxy. It must present the most basic goal-oriented activity: Stay alive. Be immortal. Win free plays.

3. The game must contain some representation of violence that is portioned out as playtime progresses and constantly strives for the player's imminent symbolic death. This does not have to be actual violence—it can be anything that eliminates the player's sprite on the video screen, no matter how absurd or impossible.

4. The game must present obstacles to the player that increase the player's exposure to the violence.

5. The game must contain a representation of a self that is placed in an adversarial position against the violence and death of the game. The player should have a representation that instills the belief that there's a shot at victory.

6. The game must offer the ability to control compelling and thrilling actions that the proxy acts out in order to triumph over the violence that prevents them from securing their immortality. This is known in the videogame design world as moment-to-moment gameplay. It's the dialogue between player and machine through its input and output devices.

7. The game's moment-to-moment gameplay must be easy to learn yet hard to master. This is an old chestnut among game designers and players, and it is gospel.

8. Gameplay must contain both random events and learnable patterns. Random elements keep gameplay fresh, while patterns provide the player with the hope that, through mastery, the goal (immortality) will be attained.

9. The game must require an interactive, coordinated physical response by the player to the audiovisual cues of the machine. You don't just watch videogames; you acquire skill and technique to win. You have to feed yourself.

10. The game experience must be portioned into short salable segments. The operator wants the cash collections to exceed the purchase price of the

machine within 6 to 20 weeks of operation. Like a tobacco company deciding the right level of nicotine per cigarette, the designer must give players just enough gameplay per cash unit that they'll return for more.

11. The game must have some novel concept or hook. This can be through either thematic or technological presentation, but, like any fad, it's a disposable pop culture innovation that eventually burns out and is replaced. Effective hooks are developed by keeping one foot in the target demographic subculture.

The Seven Genres

There are seven reliable arcade genres; at any given time, one or two are ascendant. The year 1997 sees fighting games waning and gun games in full dominance. Except for the ever-popular driving games, the half-life of a genre's ascendancy is five to seven years. Here are the seven genres:

1. Classics and Puzzle Games
2. Driving Simulators (both Standard Drivers and Drive and Shooters)
3. Gun Games (on the ground)
4. Sci-Fi shooters (Death From Above, Death From Everywhere, Battle Simulators, Scrollers)
5. Action/Scrollers
6. Fighting Games
7. Sports

Classic Videogames and Puzzle Games

In the "classics" genre are what most baby boomers visualize when they think of arcade videogames. They happened in coin-op's heyday, the mid- 1970s to early 1980s, and enjoyed the broadest base of consumer appeal. These have historically been the largest sellers. Recently, this genre has had little representation in the arcade. Its strong suit is that player status is constantly and unambiguously communicated. One look at the screen and players instantly know they are either outnumbered or making good progress. Since these games were done in much simpler times, they were often largely the work of

one or two engineers. The goal is simple: Eliminate all "bad" elements on the screen (claim the territory) and you will live forever . . . or at least until the "Game Over" screen appears.

Within the "Classics" genre is the subset of "Puzzle Games." These share abstract themes, a fixed playfield, and gameplay that both unlocks and plays upon the anal-retentive qualities hidden deep in each of us. The player is presented with a simple, compulsive, addictive task; there is neither plot nor character. The venue for this subgenre has switched from arcades to hand-held and home console devices except in Asia, where modern variations continue to find a loyal player base.

Driving Games

This is the perennial genre, popular with the casual player because of familiarity and with 14-year-old boys desperate for their learner's permits. All offerings have nonintimidating control interfaces: a steering wheel, a gas pedal, and a seat. Content evolution is driven by incremental technology improvements such as force feedback in the steering wheel, subwoofers under the seat, and polygons on the screen. Its cashbox earnings curve is more consistent and long-lived than any other genre, so these offerings can contain more expensive technology. As a manufacturer, you should always have a couple in development.

"Drive and shooters" is a subgroup of the Driver genre. It combines two of the more popular activities in the medium. A real-life version of this style of gameplay is now played on the freeways of Los Angeles. There are few offerings in this category, but almost all have been popular.

Gun Games

"Gun games" are a direct extension of the evergreen shooting galleries on the carnival midway. Stuff comes on the screen, and since you have a gun in your hand and no other way to communicate with the image, you shoot it. These games are immensely popular in today's market.

Sci-Fi Shooters

"Sci-fi shooters" are different from gun games in that they contain a third-person representation of the player that can be manipulated to avoid harm as well as to shoot. The goal is still to survive against all the destruction that is thrown at your little character. Many of these games could also qualify as classics since they enjoyed their highest popularity in the early 1980s. There is still

enough demand to support one title per year. The Asian market has much greater acceptance of these titles.

Action/Scrollers

These games are linear in presentation; they rely on a simple goal with obstacles the player must overcome. The player is usually represented as a powerful character, selected from a group of several characters. The genre is dead in the arcade now, mostly because of the glut of similar games on home-game consoles and PCs, where they are known to the trade as platform games. These, too, were most popular in the mid-1980s.

Fighting Games

In 1997, we're past the peak of the reign of the video "fighter," which should be considered violence simulators. This genre began in the late 1980s, but it strikes such a resonant chord in the target age group that it's here to stay. It serves a highly stylized social function for adolescent males. Two players each get to choose one of several hero characters, with unique martial arts skills, costume, physique, secret moves, history, and personality.

Gameplay for the experienced player is related to "rock, scissors, paper." Each player has a health meter superimposed at the top of their side of the screen. Using both defense and attack moves, players try to extinguish opponents by depleting their health meter. In Street Fighter II, the most popular fighting game on earth, each player uses six buttons and a joystick. The joystick changes the position of the character, causing it to walk, jump, duck, and defend. Buttons trigger attack animation sequences, like a punch or kick.

Beneath these simple control inputs lies a complex set of combinations. For example, by rotating the joystick through its lower three positions, then quickly pressing the upper "Fierce" button, the player's character might throw a fireball at the opponent. Timing of these combinations is precise; for the experienced player, the game lies in memorization and the ability to trigger the hidden moves. If a new title catches on, there will inevitably be sequels, with new characters, moves, and situations. Despite what most observers think, all fighting games are not the same.

Sports Games

The sports genre is simply simulations of popular spectator sports, usually themed with a license, like NBA basketball. Players control one or more on-screen characters while the computer controls all the others. As in the sports

themselves, the nuance in game design makes for much of the interest in the game. An example is variable wind speed and direction in a golf game.

What the Future Holds for Coin-Ops

The industry has always been something of an idiot savant in the worlds of entertainment and technology. Coin-op created low-cost realtime 3D graphics. Its boom in the 1970s drove down hardware prices, allowing the PC to become a technological and economic reality. Coin-op established basic techniques of interactive entertainment and was the birthplace of pop icons like Mario, Pac-Man, and Mortal Kombat. Despite all this experience, it's a very short-term-focus, close-minded business—only able to see as far as what's necessary for the next hit.

As the American coin-op market continues to stagnate at best, industry leaders wonder where we will be in ten years. Was the wildfire of 1979–1981 an anomaly, or can something new reignite a blaze of equal magnitude, drawing the public from their cocoons replete with VCRs, Web-browsing PCs, and game consoles? Must we be content with marginal profitability on the coin-op side, reaping the true harvest in consumer sales? The scary part is that our domestic business is not growing even at the rate of the population.

There is promise in growing markets like Indonesia, Korea, Brazil, and the sleeping giant, China, but do their cultures find the same games entertaining? Will networked arcades, tournament play, or improved FECs be the spark? I know—if we just could make a really huge mega-hit game . . .

The Manufacturer/Product Development Side

The big corporations lured by the multimedia promise of the early 1990s finally realized, after losing much money drilling dry wells in areas like infotainment, that the only widely successful multimedia are games with arcade roots targeted at adolescent males. They also learned that this industry is a risky and limited market with too few talented authors. All but the most stubborn corporations have gone away, leaving in their wake a few restructured and consolidated companies. Heck, even the Hollywood trade magazine *Variety* no longer runs its short-lived "Multimedia" section. Good riddance.

As the technology trends toward off-the-shelf hardware, coin-op R & D departments will become more focused on software and content. Faster, cheaper technology with higher bandwidth and storage will only raise the quality bar. Within five years we will have worked our way through the "polygon count is paramount" period. Hollywood, videogames, and TV will all use the same digital tools, which will continue to improve the quality of

the content and allow game companies to use more external resources in order to create games.

The world will settle on six or seven coin-op companies. Each will have consumer development divisions that will exploit their successful properties. Because of standardized technologies, they'll be able to have more outside development teams, but they will still rely mostly on in-house staff to maintain their core competency.

If the manufacturers are smart, they will figure out a way to get into the cashbox to increase their current share of the overall gross or box office. This is the model that works for the movie industry, which enjoys only a slightly bigger total cashbox but is much bigger on the production side. It will be done through networks that link all games in the country.

The Operations Side

With the banning of cigarette machines in most states and the declining number of bars where pool tables can be operated, the next five to ten years will see more shrinking of the operator base. Every few years a really great game will come along, and operators will forget the bad times for a while. The large national accounts—SEGA, Namco, Nickels and Dimes, Dave and Buster's—will continue to change ownership from time to time, but the number of big FECs and arcades will stabilize in close proximity to the populations that support them.

If operators are smart, they will start sharing the cashbox with the manufacturers, who, in turn, must offer values like higher-end technologies, national advertising, tournaments, networks, and frequent downloaded software updates to extend the earnings curve.

The Player Side

One-stop family fun centers, now nearing or past their peak, will run their course and give way to new formats within five years. Adolescents will be in charge of determining new social gathering spots to be outfitted with interactive play. Arcade games and their consumer ports will continue to be the biggest multimedia market for quite a while. Because of the content, the target market, 14-year-old boys, will basically stay the same. Because of the target market, the content will basically stay the same. If this sounds strange, consider Barbie over the past 30 years. Boys will be boys.

Players will come to enjoy expanded connectivity between games. Intergame, intercity implementations will be toyed with by the manufacturers until the audience decides what they like. Driving games will remain popular.

Summary

Coin-op games are what they are because of what the audience demands. They appeal to the basest of desires—violence, speed, territory, and compulsion—because these are most gratifying to the player base. It's a fashion business that has to quickly respond to customer whims despite a one- to two-year product gestation period. The industry must create the most usable of human interfaces and the most addictive multimedia drug possible in order to exist. It must use many tricks to pull this off in a cost-effective manner. To succeed, it requires a collaboration of artistic, technologic, and literary creativity. All of this makes for an incredibly interesting and challenging industry in which to apply one's craft.

If designers or entrepreneurs involved with interactive entertainment want to go after the big bucks, they shouldn't be surprised if they are constrained to content that doesn't stray far from the Seven Genres. If designers out there prefer to be more innovative by introducing new themes and interactive formats, they shouldn't count on a quick win. Coin-op games and the resulting highest-volume-consumer sellers are what they are from years of natural selection. The Mortal Kombat multi-revenue–stream success story will be hard to repeat with a more politically correct theme. In other words, if you go to Las Vegas looking for the big payoff, you'd better love the tacky architecture. If you want to draw the big crowds, you're gonna need the bright lights, pinkie rings, and plenty of cash to burn.

Biography

In the early Macintosh market, Mark Pierce was the designer/animator of Dark Castle and Beyond Dark Castle. He was also one of the three founders of MacroMind, now MacroMedia, where he drew, animated, and coauthored his way through MusicWorks, ArtGrabber with BodyShop, and, most importantly, VideoWorks (now known as "Director"). Other Mac products for which he designed and/or created artwork were Winter Games and the EASY3D art disk. Prior to these now-forgotten accomplishments, he spent the earlier part of his post-art-school days porting games to crucial platforms like Coleco-Vision and designing/programming and animating Bally's coin-op game Professor Pac-Man. After moving to California in 1985, Mr. Pierce joined Atari, where he was Designer/Animator/Project Leader on the coin-op games Road Riot 4WD, KLAX, Pit-Fighter, and Escape from the Planet of the Robot Monsters. He was also a designer and the animator on RoadBlasters. For the past four years, he has been senior vice president of Coin-Op Product Development and executive producer at Atari Games in Milpitas, California. During his tenure as VP, he has delivered Primal Rage, T-Mek, a novelty game called Hoop It Up, Area 51, Wayne Gretzky 3D Hockey, San Francisco Rush, and Maximum Force.