

Game Development Essentials

Third Edition



Jeannie Novak

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**Game Development Essentials:
An Introduction, Third Edition**

Jeannie Novak

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CHAPTER



Historical Elements

how did we get here?

Key Chapter Questions

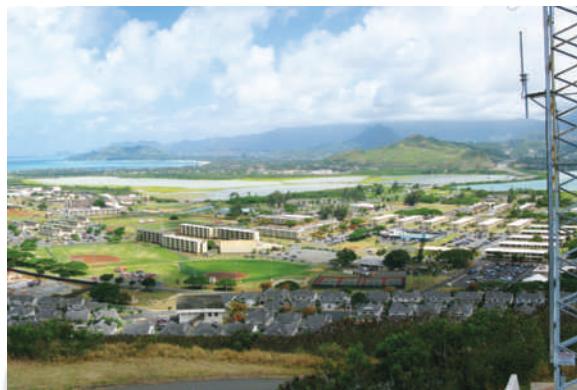
- What are the significant *milestones* in the history of electronic game development?
- Who are game development *pioneers*, and how did they contribute to the industry?
- How did the game industry evolve from coin-operated electromechanical and mainframe computer games of the 1960s to the console, personal computer, online, and mobile industries of today?
- What factors contributed to the *video game slump* of the early 1980s?
- Why did certain game companies and titles succeed during game development history—and why did some fail miserably?

If you plan to become involved in the game development industry, it is important that you learn about its evolution. Did it begin with video arcades? Was there life before *Pong*? Has the industry always been successful? As you read this chapter, think about the first electronic game you ever played. Did you play it on a personal computer? On a home game console? At a video arcade? At a pizza parlor? What did you like about the game? After you finish this chapter, you will probably be surprised at the strange and unusual events that have occurred during the development of an industry that is still in its infancy.

Before the Arcades

The first electronic games were not played at home or even at video arcades. Instead, research departments at universities, labs, military installations, and defense contractors provided the backdrop for this industry. At military bases, electromechanical games were provided for the recruits to escape from the rigors of basic training. Meanwhile, a few bleary-eyed, overworked students, programmers, faculty, and researchers in academic and government institutions turned their mainframe computers into game machines—providing them relief from traditional duties such as performing complex mathematical calculations for research. Late at night, these pioneers spawned what would become one of the most compelling forms of entertainment in history.

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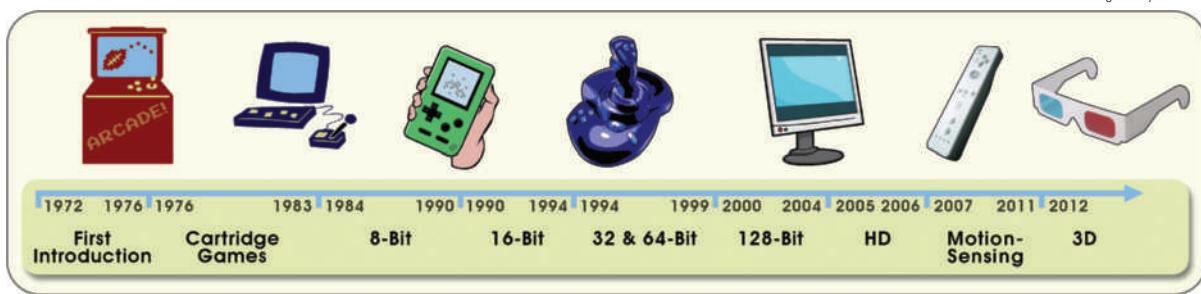
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The first electronic games were played at military bases such as the Marine Corp Air Station Kaneohe (left) and at academic institutions such as the Massachusetts Institute of Technology (right).

Two distinct segments of the electronic game industry developed in parallel, starting in the 1950s. One of these segments began in 1951 when Marty Bromley, who managed game rooms at military bases in Hawaii, bought electromechanical machines and launched SEGA (an abbreviation for SErvice GAmes). This segment of the industry grew into the coin-op video arcade industry, which experienced a boom in the 1970s. Electronic versions of arcade favorites marked the beginning of what was to become the console game industry of today.

The other segment of the electronic game industry started with mainframe computer games developed by faculty and students at universities who wanted to either hone their programming skills or entertain each other during breaks from the long hours spent working on their dissertations. Although an adaptation of one of the early mainframe games (*Spacewar!*) became the first coin-op video arcade game in the United States, it was not until the personal computer revolution that mainframe games were adapted for personal computers. It was then that the computer game industry was born.



Many companies and developers made significant contributions in the creation of game systems and content. You might recognize many companies that were formed in that era, and you might even have played some games that were developed during that time. What companies made a difference in the evolution of this industry? Who were the pioneering designers, artists, programmers, and producers responsible for developing compelling games that continue to inspire developers today?

A few companies were ready to plunge in just as the electronic game industry began. Some of them maintain a significant presence in the industry. You might be surprised at how they began—and how they continued to develop. Some of them initially had nothing to do with games, or even entertainment. Others tried, and failed, to dominate every segment of the game industry. Many came and went, and a few are still going strong. Some stepped out of the picture for a while, only to return with a vengeance during the second “golden age” of the industry. As we look at the arcade phenomenon, we’ll focus on some of these companies and the popular games they developed.

::::: They're All Video Games Now!

The term “video game” came out of the arcade business and gravitated toward the home console game business. There was a demarcation between games played on personal computers (*computer games*) and those played on home consoles (*video games*)—with electronic being used to refer to both. Although sometimes you’ll still see a distinction made between “computer” and “video” games, today’s electronic games are often referred to as “video games” across the board.



The Arcade Phenomenon

The public was first introduced to electronic games not through home game consoles or personal computers, but through public arcades. Before video games were introduced, the most popular arcade games were electromechanical pinball machines. Arcades were often located in small amusement parks, attracting children and teenagers—who challenged each other to pinball matches as part of a regular weekend social event. As video games became more popular, arcades became more accessible. Conveniently located near schools and residential areas, arcades became flooded with teens after school. At the height of the craze, kids spent hours at the arcades—sometimes into the night, forgetting to eat, or to do their homework!

::::: Sega: Setting the 25-Cent Standard

Sega



In 1956, just a few years after Marty Bromley started SEGA, Rosen Enterprises' David Rosen began importing coin-operated electromechanical games to Japan—launching the country's coin-op business and becoming Japan's largest amusement company. In 1964, Rosen Enterprises merged with SEGA to form Sega Enterprises. Acting as a bridge between

the United States and Japan, Sega Enterprises released the first Japanese export, *Periscope*, in the United States. It is interesting that the high shipping costs of this export were what made U.S. arcade owners charge 25 cents to play the game—setting a standard for future arcade games. Sega was purchased by Gulf & Western in 1969—but David Rosen and partner Isao Okawa bought it back in 1984. The price tag: \$38 million.

Several games are considered milestones of this era. Although limited by the technology of the time, these games were innovative—inspiring new trends in content, genres, gameplay, and development techniques that had never been considered. Some of these games were extremely popular—successfully capturing a broad market that went far beyond the stereotypical “male teen” demographic. They provided hope for the future of electronic games as a mass entertainment medium. Many of these games are considered so nostalgic by gamers from this era that they have been re-released in console, computer, or handheld format so that they can be experienced again. You might recognize a few of them!

Computer Space

In 1961, MIT student Steve Russell developed *Spacewar!*—the first interactive computer game—on the university’s mainframe computer. Nolan Bushnell, who later founded Atari, saw the game and decided to bring it to a larger market by adapting it into a stand-alone arcade coin-op game. Calling his version *Computer Space*, Bushnell sold the idea to Nutting Associates in 1971. The game, which consisted simply of trying to shoot a flying saucer, might not have been as compelling as a pinball game—and its low sales reflected this. However, Bushnell started the coin-op video arcade industry by bringing an elitist form of entertainment that had remained enclosed within the ivory tower of the university system out to the masses. In 1978, after video game arcade technology became more sophisticated, Cinematronics released *Space Wars*—another arcade adaptation of Russell’s mainframe game.



Atari's Wild Ride

After *Computer Space*, Bushnell left Nutting Associates to start Atari with partner Ted Dabney. (The word “Atari” is from the board game *Go* and means roughly, “Look out! The move I’m about to make will be dangerous to you”—similar to “check” in chess.) After surviving a legal dispute with Magnavox over the rights to the first successful video game (*Pong*), Atari became the most prolific presence in the arcade business—churning out games such as *Asteroids*, which became the first blockbuster video game and forever associated the name “Atari” with the video arcade. After Bushnell left the company to start several ventures, Atari was purchased by Warner Communications in 1976, and began spending more energy on business affairs and marketing than design and development. Concerned about the growth of the console and personal computer industries, Atari also began shifting its focus away from its arcade business and toward console systems (such as the VCS/2600) and personal computers. In 1984, Atari was sold to Commodore founder Jack Tramiel—who in turn sold it to disk drive manufacturer JTS, who then filed for bankruptcy in 1999 and sold it to Hasbro Interactive. The Atari name was revived when Infogrames took over Hasbro in 2000 and completed its acquisition of Atari in 2008. Nolan Bushnell came full circle in April 2010 after replacing former Atari CEO, David Gardner, as a member of the board of directors.

Atari Interactive, Inc.



Pong

The beginnings of the first memorable—and controversial—electronic game appeared in 1958 when Willy Higinbotham of Brookhaven National Laboratories in New York showcased his table tennis-style game (*Tennis for Two*) on an analog computer. Almost

Atari Interactive, Inc.



Pong—the first successful arcade game.

a decade later, Ralph Baer of Sanders Associates began researching ideas for an interactive “table tennis” television system. He patented his idea in 1968, and Magnavox licensed it from him in 1970. The Magnavox Odyssey interactive game console—featuring Baer’s “table tennis” game—was demonstrated in 1972. The first Atari game, *Pong* (designed by Atari engineer Al Alcorn) was released that same year. The controller was a two-direction rotary dial, and the rules of the game were simply “use your paddle to avoid missing ball for high score.” *Pong* soon became the first successful coin-op arcade game. Magnavox sued Atari that same year, claiming that Bushnell had stolen the idea. The case was settled out of court.

||||| Ralph Baer & Simon

Hasbro, Inc.



Ralph Baer, who invented the Magnavox Odyssey (the first home console system), was inspired by the Steven Spielberg film *Close Encounters of the Third Kind* when he created the successful musical memory game, *Simon*—released by Milton-Bradley during the holiday season in 1977. Baer also invented the first light-gun game.

As a young child in the late 1970s, I encountered my first video game, *Pong*, prominently displayed in the children’s clothing section of Macy’s Department Store in San Leandro, California. I was entranced, excited to play, and mesmerized as I watched my hand control a rectangle that bounced a square to my opponent. Both of us gleefully volleyed the square back and forth, feverishly trying to get the other to miss a shot—as *Pong*’s simple “beeps” and “blips” added to our delight.

—Jennifer Penton (Creative Director, i2i Communications)

Asteroids

Although *Space Invaders* (1978) was the first arcade game that recorded high scores, *Asteroids* (1979), was the first to allow players to enter their initials into a high score table. *Asteroids* (designed by Ed Logg) utilized monochrome vector graphics, which allowed the game to display fast-moving objects made up of very sharp lines instead of the crude pixel graphics common in video games of that time. (Vector graphics would later come back as polygons—and 3D games!)

Atari Interactive, Inc.



My first experience with an electronic game was the original *Asteroids*. It was on the second floor of my mom's racquetball club in Cincinnati. The most memorable thing about the game was that for years I only got the chance to dream about destroying the "real detailed" silvery-looking asteroids because I was never allowed to insert 25 cents. My mom thought video games were a waste of money.

—Rebecca Voss (Harris Corporation - Defense Communications Systems)

Pizza & Mechanical Animals: The Family Arcade Experience

In an attempt to remove the stigma associated with the public's idea of arcades, Atari founder Nolan Bushnell opened up a string of pizza parlors initially known as Pizza Time Theater. Eventually becoming Chuck E. Cheese, these family restaurants offered game tokens with every meal, a video arcade for kids who would play while waiting for the pizza, and a "live" floor show featuring Chuck E. Cheese himself (along with other mechanical robot animals) for the whole family to enjoy while eating.

Galaxian

Bally/Midway imported some of the most popular "slide and shoot" games to video arcades. *Space Invaders* was the first blockbuster video game, and *Galaxian* was the first video game with a full-color monitor. *Galaxian* was followed by several sequels—including *Galaga*, *Galplus*, *Galaga '88*, and *Galaxian 3*.



Game Violence

In 1976, the first public controversy over video game violence occurred in response to the Exidy Games release of *Death Race*, in which players drove over “stick figures” representing pedestrians. (Compare this to the *Grand Theft Auto* series!) The game was inspired by the 1975 cult film, *Death Race 2000* (starring David Carradine and Sylvester Stallone in one of his first roles)—in which pedestrians are run down for points in a cross-country car race of the future. Protests were so widespread that even *60 Minutes* did a story on *Death Race*—bringing video games into public awareness. The publicity didn’t help the game, though—since nervous arcade owners eventually refused to carry it.

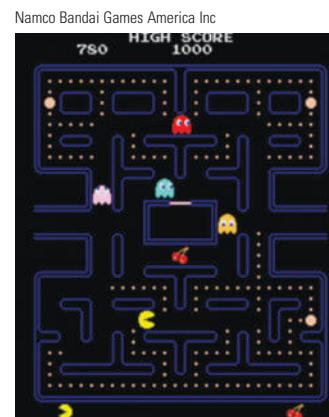
::::: “A” for “Activision”

Activision



Pac-Man

In 1980, Namco released *Pac-Man*—which appealed to a much wider market, in part because it did away with the “shooting” theme that pervaded most other games. The game’s controller consisted only of a multi-directional joystick. Instead of shooting



Pac-Man is one of the most popular arcade games of all time.

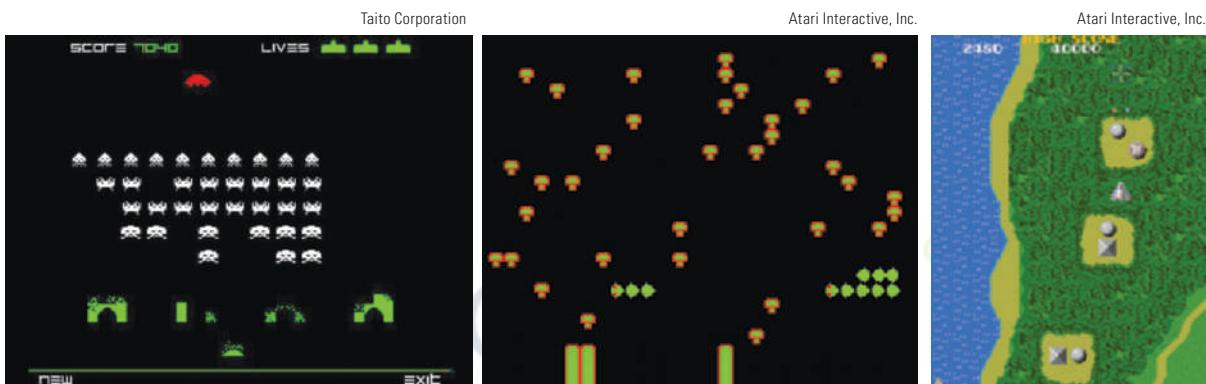
It is not uncommon for employees in the game industry to leave one company and start a new one so they can retain creative leadership. Activision, one such company, was the first third-party game publisher, and was established in 1980 by former Atari programmers. The name was specifically chosen because it came before “Atari” alphabetically.

spaceships, *Pac-Man* ate power pills—which allowed him to munch on his ghostly enemies for a short while. *Pac-Man* was developed primarily by Namco employee Toru Iwatani over a period of 18 months. Over 300,000 units were sold worldwide—making *Pac-Man* the most popular arcade game of all time. As players successfully completed one maze, they moved up a level—which contained the same maze, but play was more difficult. *Pac-Man* spawned an even more popular and inclusive sequel: *Ms. Pac-Man*, the first game to star a female character. Instead of the increasingly difficult maze used in

levels of play in the original game, there were four different mazes used in *Ms. Pac-Man*. The game even incorporated a rough three-act plot structure that featured animated sequences (a primitive form of the cinematics used in today's games) as dividers. In Act I, Pac-Man and Ms. Pac-Man meet; in Act II, Pac-Man woos Ms. Pac-Man by chasing her around the screen; and in Act III, Pac-Man, Jr. is born. The game had great crossover appeal, helping to further widen the market to include girls and families. Boys played it, too—finding the game even more challenging and addictive than its predecessor.

::::: Arcade Graphics Evolution

Arcade games evolved from the static screen and horizontal movement of *Space Invaders*, to the limited vertical movement of *Centipede* and, finally, to the scrolling screen of *Xevious*.



Women Enter the Arcade World

Released by Atari in 1981, *Centipede* was the first arcade game co-designed by a woman. Dona Bailey and Ed Logg teamed up to create a game with the goal of shooting quick-moving centipedes as they appeared at the top of the screen and tried to snake their way down. Each time a segment of the centipede was hit, it turned into a mushroom. The game was designed in a unique pastel color scheme.

My friends and I would go to the local arcade and play games till we ran out of money or our hands developed blisters and went numb. I would get so excited when I played that I would get drenched in my own sweat and have to walk around trying to dry off so that my mom wouldn't find out that I had been at the arcade.

—Arash John Sammander (game design and production graduate student, Aalto University of Art & Design [TAIK] - Finland)

Donkey Kong

In 1977, Shigeru Miyamoto was hired as Nintendo's first staff artist. The company initially assigned him to *Radarscope*—a submarine game that consisted of repetitive button-pushing without any real story or characters. Although this was the typical

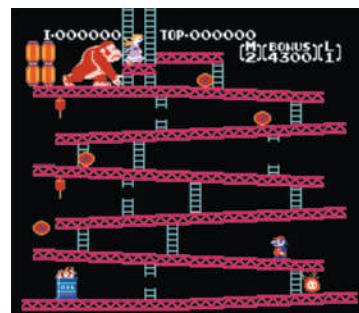
game style of the time, Miyamoto wanted to create something unique. The result was, a game that represented a cross between *King Kong* and *Beauty and the Beast*. In, an ape steals his keeper's girlfriend and runs away. The player takes on the role of the keeper (Mario)—who becomes the hero of the story as he attempts to rescue his girlfriend (Pauline) from the clutches of the beast.

Nintendo



Donkey Kong kicked off a successful franchise still wildly popular.

Nintendo



Nintendo made its phenomenal entry into the U.S. market with *Donkey Kong*. Like *Pac-Man*, the popularity of this game resulted in a series of successful, although confusing, sequels. Mario (originally called Jumpman) first appeared as the heroic carpenter whose goal was to rescue his girlfriend. The game's sequel, *Donkey Kong Junior*, switched the roles of Mario and the ape so that Mario was the enemy—an evil carpenter who had caged the now apparently innocent ape from the original game. The player took on the role of the baby ape who attempts to rescue his father (the ape from *Donkey Kong*) from Mario's evil clutches. In the third game, *Mario Bros.* (released in 1983), more confusion arose. Instead of being a carpenter, Mario was a plumber. He and his brother, Luigi, were known as the "Mario Bros." (Was Mario's full name "Mario Mario"?). The action takes place in a sewer, where two players take on the roles of Mario and Luigi to battle each other and an infinite supply of creatures (e.g., turtles and crabs) that emerge from the surrounding sewer pipes.

After *Donkey Kong*, Shigeru Miyamoto went on to develop a series of Mario titles. In fact, each time a new game system is introduced by Nintendo (starting with the original NES—discussed later in this chapter), Miyamoto designs a Mario game as its flagship title. Miyamoto's credits also include *Zelda*, *Star Fox*, *Pikmin*, and *Metroid Prime*.

Why "Donkey Kong"?

You might wonder why a game involving a gorilla and a carpenter would be called *Donkey Kong*. Since the gorilla in the original game was "stubborn," Shigeru Miyamoto—creator of *Donkey Kong*—wanted to call the game *Stubborn Gorilla*. In search of a more snappy English translation, Miyamoto found that "donkey" could represent "stubbornness" and "kong" could represent a gorilla (as in the film, *King Kong*).

The U.S. arcade business reached its peak in 1981, as revenues reached \$5 billion and Americans spent more than 75,000 hours playing video games. But the following year, the business experienced a decline from which it never fully recovered.

::::: Nintendo: Ancient History

Nintendo, which became one of the “big three” in today’s console wars—and a major contender in the handheld market—

was established in 1889 by Fusajiro Yamaguchi to manufacture and distribute Japanese playing cards known as *Hanafuda*. It wasn’t until 1980 that Minoru Arakawa opened Nintendo of America. Nintendo jumpstarted the second “golden age” of the video game industry by releasing the Nintendo Entertainment System (NES) home console.

Nintendo



leighjevans (Photobucket)

Tron

Released in 1982 by Bally Midway, *Tron* was the first video arcade game to be licensed from a film studio. The film itself was about characters going inside games and competing with each other, so the tie-in with an arcade game was fitting!



::::: Collecting Quarters for *Pole Position*

In 1982, Namco released *Pole Position*—which pioneered the “chase-cam” and became the first wildly successful driving game. One of these arcade games was in the breakroom at a now-defunct but then-successful recording studio in Los Angeles. During breaks from recording, famous bands and artists played the game incessantly—always putting a quarter in the slot per play. Little did they know that this wasn’t necessary because the owner had deactivated the coin box control. (The staff knew about it, and they just played for free!) Every few months, the staff used the quarters to pay for a big company dinner—thanks to its clients’ video game addiction!

Namco Bandai Games America Inc



The Birth of Console Games

Although the Magnavox Odyssey—the first home game console—was released in 1972, it wasn’t until the late 1970s that the home console industry began to take shape. Pre-dating the video arcade industry boom, the Odyssey was ahead of its time. The video arcade industry was business-to-business—with machines sold to arcade operators rather than to consumers. The high price tag on standalone arcade machines made it prohibitive for all but the wealthiest consumers to own them. However, it became clear that selling directly to consumers (business-to-consumer) could expand the industry tremendously—so video arcades began moving into the home in the form of affordable game consoles. These systems used the television as a monitor and competed for market share much like Sony (PlayStation), Microsoft (Xbox), and Nintendo (GameCube).

Atari VCS/2600

Although the first programmable home game to use cartridges (Channel F) was released in 1976 by Fairchild Camera & Instrument, the inexpensive Atari VCS (Video Computer System)/2600 took off one year later—successfully launching the home game console industry. Atari kept the price of the hardware low and made most of its money from the game titles it developed for the console. Popular titles included *Adventure* (where a block-shaped knight searched for keys and a magic chalice, always on the lookout for angry dragons) and *Yar’s Revenge* (where a race of mutated houseflies that had relocated to space sought revenge on an army setting up camp on the right side of the screen). When Atari adapted the blockbuster arcade game *Space Invaders* for the VCS format in 1980, the practice of selling home versions of arcade games began. Atari followed up with its less-successful 5200 in 1982, and the 7800 in 1984.

Atari Interactive, Inc.

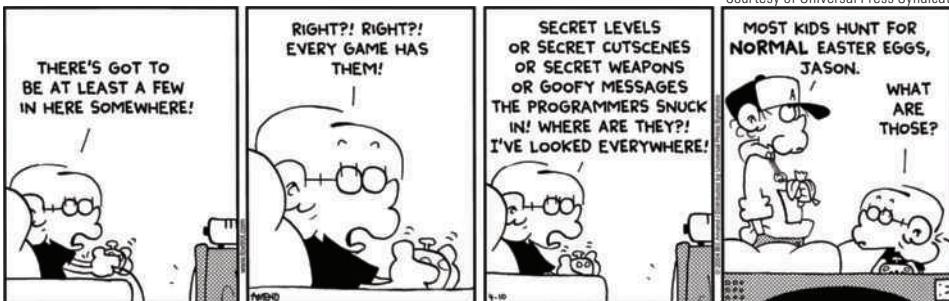


The Atari VCS/2600 successfully launched the home game console industry.

::::: The Hidden “Easter Egg”

The first video game “in joke” (known as an “Easter egg”) was programmed by Warren Robinett in the VCS game *Adventure*. The hidden information was Robinett’s credit; it symbolized the need for game developers to get the credit they deserved for their work. It turned out that Robinett made one pixel on a wall in a room active—linking to a hidden room containing his credit. When the Easter egg was discovered by a teenager—who wrote Atari an excited letter about it—other developers were inspired to hide their names and other messages in games. The tradition continues (whether or not the game companies know about it).

FoxTrot by Bill Amend
Courtesy of Universal Press Syndicate



It was love at first sight when I laid eyes on *Vanguard* for the Atari 2600 (cue Jekyll-Hyde transformation). I never thought blasting those 16-color panels in *River Raid* could be so fulfilling. It was like “bending space and time.” I started playing at about 8 a.m.—and suddenly it was 3 p.m. My friend’s mom was shooing us out for being inside all day. (I believe it’s some sort of singularity like a black hole; neither light nor time can escape!)

—Aaron Nash (*game art and design student*)

Mattel Intellivision

Atari had some competition two years after the release of the VCS when Mattel released an arguably superior (and more expensive) console system known as Intellivision. Instead of a joystick (like the VCS), the Intellivision was equipped with an “intelligent” controller consisting of a keypad and a movement disc resembling the “track pad” on some of today’s laptops. Game-specific plastic overlays were available to slide over the controllers, and the system even had rudimentary voice synthesis (with the purchase of an attachable component—the Intellivoice). In 1984, Mattel Electronics was shut down after heavy losses and sold to a Mattel vice president, Terry Valeski, who renamed it Intellivision Inc.

Mattel, Inc.



Mattel’s Intellivision game console used a keypad and movement disc instead of a joystick.

:::: Mattel's Handhelds: One Sport at a Time

In 1977, the same year that Atari released the VCS/2600, Mattel launched the handheld game industry by releasing a series of LED- (light emitting diode) based portable games. Unlike cartridge-based handhelds, these systems could contain only one game! If you wanted to play another game, you had to buy another portable. Fortunately, the games were inexpensive! Some popular titles were *Auto Race*, *Basketball*, *Bowling*, *Football*, and *Sub Chase*.

Mattel, Inc.



Mattel, Inc.



Football and *Sub Chase*—two of Mattel's popular handheld games.

Around 1984 (I was six years old), I took a handheld football game away from my male cousin. I remember feeling a sense of excitement being a girl playing a boy's game, especially when I beat all the neighborhood boys' scores.

—Carissa Gerardo (*Operations Supervisor, Integrated Marketing Services*)

Colecovision

Colecovision's entry into the console market was Colecovision—containing mushroom-like joystick controllers and superb graphics. Blending the best of the VCS/2600 and Intellivision, Colecovision soon became the standard for reproducing the arcade experience at home. Nintendo's wildly popular arcade game, *Donkey Kong*, was included with every Colecovision. Most of the early titles were adaptations of other memorable arcade titles such as *Venture*, *Mr. Dot*, *Lady Bug*, and *Space Fury*.

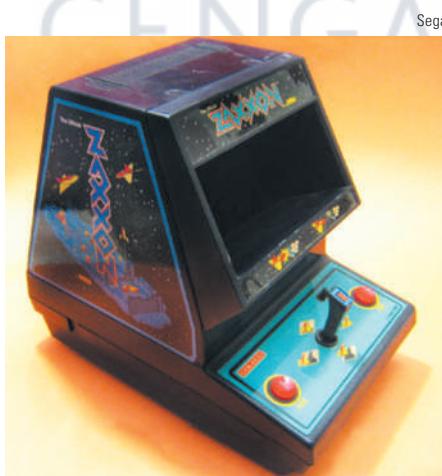
::::: Cobbler to Cabbage Patch: Coleco's Diverse History

The Connecticut Leather Company (later shortened to Coleco) was established in 1932 by Russian immigrant Maurice Greenberg to distribute leather products to shoemakers. The company soon began making leather craft kits for kids based on popular icons Howdy Doody and Davy Crockett. After competing in the first console wars of the home gaming industry with a superior system (ColecoVision) and releasing the successful Cabbage Patch Kids toys, Coleco filed for bankruptcy in 1988.

River West Brands



In the 1970s and 1980s, Coleco released some of the most memorable handheld games, including mini tabletop arcade games of popular titles such as *Zaxxon*, *Frogger*, and *Galaxian*. These mini arcade games were cleverly designed to emulate the look and feel of real stand-up arcade games, down to the joystick controller and cabinet art.



Sega's *Zaxxon* was just one of the arcade games transformed into a mini tabletop game by Coleco.

Just when it seemed like the video game industry was unstoppable, it halted. The entire industry—including arcades and the home console segment—experienced a “slump” during the early 1980s. The arcades never recovered from it, although the home console segment experienced an amazing recovery in the mid-1980s. What happened, and why?

The first electronic game I remember playing was *Smurfs* on ColecoVision. I think I was about six years old. I thought I was so cool—as I jumped over the fences and ducked under the bats that swooped down on me!

—Elizabeth Butler (game art and design student)



Coleco's ColecoVision blended the best of the VCS/2600 and Intellivision console systems.

Mattel, Inc.

The Video Game Slump & a New Golden Age

Several theories have been attributed to the video game industry slump of the early 1980s. Perhaps the industry just experienced a temporary decline, and the platforms and titles introduced were just not revolutionary enough to reverse it. Oversupply might have also contributed to the slump; over 50 software companies produced cartridges, saturating the market with titles. There was also a lack of innovation—and low-quality and derivative games flooded the marketplace. Market conditions forced the price of games to be lowered to \$5 to stay competitive. Many video game developers were also concerned that home computers would take over the home gaming market altogether. Because this industry had never experienced a decline, the general public started questioning its legitimacy—wondering whether home gaming was simply a fad, like the short-lived “hula hoop” craze!

Nintendo

Nintendo's entry into the console business in 1985 breathed new life into the home gaming industry—but it also helped push the arcade business into extinction. The system was far superior to consoles of the previous era, and the titles were graphically advanced—with compelling storylines and characters. Titles such as the *Super*



The Nintendo Entertainment System (NES) revolutionized the console industry.

Mario Bros. arcade conversion, *The Legend of Zelda*, and *Punch-Out!!* (where players had the thrill of bashing boxing legend Mike Tyson) were engrossing—with seemingly limitless environments. Over 50 million NES systems were sold. The release of the improved Super NES (SNES) in 1991 solidified Nintendo's presence in the marketplace. A year later, Nintendo released *Super Mario Bros. 3*, the most successful non-bundled game cartridge of all time.

The NES became so successful in the marketplace that the former industry leader Atari established Tengen, a subsidiary that exclusively focused on developing games for the NES. Soon afterward, Tengen discovered a way to bypass Nintendo's “lockout chip” and produce NES-compatible games without Nintendo's approval. Tengen then acquired the rights to sell the extremely popular puzzle game, *Tetris*. After it was discovered that Tengen bought the rights from Mirrorsoft (which did not actually own the rights), the game was removed from the marketplace—and Nintendo, which had acquired the legitimate rights to the game, released it under its own label.

The first real video game I ever played was the *Super Mario Bros.* that came with the original NES system. I played it night and day, and I even taped my final victory against King Koopa. It was quite an achievement for me back then.

—Robert Ferguson (game art and design student)

::::: Alexey Pajitnov & *Tetris*

Tetris originated in Russia around 1985 and was never patented. At the time, intellectual property rights were not established in the former Soviet Union for private individuals. The original author of *Tetris* was Alexey Pajitnov, assisted by Dmitry Pavlovsky and Vadim Gerasimov. *Tetris* has been embroiled in a strangely large number of legal battles since its inception. The IBM PC version eventually made its way to Budapest, Hungary, where it was ported to various platforms and was “discovered” by a British software house named Andromeda. They attempted to contact Pajitnov to secure the rights for the PC version, but before the deal was firmly settled, they had already sold the rights to Spectrum Holobyte. After failing to settle the deal with Pajitnov, Andromeda attempted to license it from the Hungarian programmers instead. Meanwhile, before any legal rights were settled, the Spectrum Holobyte IBM PC version of *Tetris* was released in the United States in 1986. The game’s popularity was tremendous, and many players were instantly hooked—it was a software blockbuster. By 1989, half a dozen different companies claimed rights to create and distribute the *Tetris* software for home computers, game consoles, and handheld systems. Nintendo released their version of *Tetris* for both the Famicom and the Game Boy and sold more than three million copies. The lawsuits between Tengen and Nintendo over the Famicom/NES version continued until 1993. In 1996, Alexey Pajitnov and Henk Rogers formed The Tetris Company, LLC and Blue Planet Software in an effort to get royalties from the *Tetris* brand, with good success on game consoles but very little on the PC front. *Tetris* is now a registered trademark of The Tetris Company, LLC.

The Tetris Company, LLC



What eventually became a great rivalry between Sony and Nintendo began in 1986, when the two companies agreed to create a CD-ROM for the SNES. In 1991, Sony revealed its “PlayStation” console (an SNES with a built-in CD-ROM drive) at the Consumer Electronics Show. After this announcement, Nintendo turned to Philips to create a CD-ROM compatible with the Philips CD-i (“interactive”) system. Concerned with Nintendo’s move, Sony scrapped the old “PlayStation” developed for Nintendo and began developing a 32-bit CD-only game machine to compete aggressively with Nintendo both in Japan and in the United States.

I remember being six years old, and all I wanted for the holidays was an NES. I played *Duck Hunt* with my father every day after school. It was like our bonding time between school and work—and it became a routine as the years, and systems, went on. By the time my brother was three years old, he would join in on the fun, too!

—Lisa Hathaway (game art and design graduate)

Cheating with the Genie

In 1991, Galoob Toys released the Game Genie, which lets players cheat in NES games and win more easily. Nintendo attempted to prevent Game Genie sales—citing that it reduced the long-term value of its games.

Nintendo revolutionized the industry again with the Game Boy—a portable system that launched a new era of handhelds in 1989. The ever-popular *Tetris* was the flagship title for the monochrome system. The Game Boy was succeeded by the Game Boy Color (1998) and the Game Boy Advance (2001). The Game Boy Advance SP (2003)—which resembles a miniature laptop and has a backlit screen—is still in wide use. Its successor, the Game Boy Micro, was launched in 2005. Nintendo continues to play a major role in the newest era in portable (now “handheld”) gaming with its DS series, first launched in 2004 and discussed later in this chapter.



Nintendo's Game Boy (Game Boy Color, left)—followed by the Game Boy Advance, Game Boy Advance SP (middle), and Game Boy Micro (right)—kicked off a new era in portable gaming.

Tiger's Multipurpose Handhelds

In 1997, Tiger released a monochrome handheld system called “game.com” to compete with the Game Boy. Unlike Nintendo’s special-purpose game system, Tiger’s featured a built-in solitaire game, calculator, personal contacts database, and calendar. It also included a stylus and touch-screen technology, and it could hook up to a standard modem to access a text-based email service.

Sega

Following Nintendo's successful launch of the NES, Sega began releasing a slew of game systems in the 1980s and 1990s—including the Sega Master System (SMS), Genesis, Saturn, and Dreamcast. In 1991, Sega reinvented itself with *Sonic the Hedgehog*—a game that featured a fast-moving blue creature in red tennis shoes. The character of Sonic was so successful that it became Sega's mascot (and a serious challenger to Mario), giving Sega 55% of the 16-bit market. (The character's name was trademarked by Sega as "Sonic The Hedgehog" with a capital "T"; Sonic's middle name is officially "The"!) Although the Sega Genesis outsold SuperNES in 1992, allowing Sega to effectively take control of the U.S. console market, Sega's follow-up releases did not fare as well and were both discontinued. By 1995, Sega of America was juggling seven separate and incompatible game platforms—Saturn, Genesis, Game Gear, Pico, Sega CD, 32X, and 32X CD.



The Sega Master System (SMS) was Sega's first entry into the console market.

::::: Video Game Violence: Senate Hearings & the ESRB

In 1993, U.S. Senators Joseph Lieberman of Connecticut and Herbert Kohl of Wisconsin held hearings on violence in computer and video games. Shortly thereafter, the industry created the Entertainment Software Rating Board (ESRB) to provide parents and consumers with detailed information on game content so they can make appropriate purchasing decisions for their unique households. The ESRB independently assigns computer and video game content ratings, enforces industry-adopted advertising guidelines, and helps ensure responsible online privacy practices for the interactive entertainment software industry. The rating system is voluntary, although virtually all games that are sold at retail in the U.S. and Canada are rated by the ESRB. Many retailers, including most major chains, have policies to only stock or sell games that carry an ESRB rating, and most console manufacturers will only permit games that have been rated by the ESRB to be published for their systems. For more information on the ratings, visit <http://www.esrb.org>.

The ESRB rating icons are registered trademarks of the Entertainment Software Association.



ESRB ratings symbols include EC (Early Childhood), E (Everyone), E10+ (Everyone 10+), T (Teen), M (Mature), AO (Adults Only), and RP (Rating Pending).

3DO & the Bit Wars

In 1992, Electronic Arts founder Trip Hawkins started 3DO—a new company that received major backing from Panasonic, Time-Warner, and MCA—to release a 32-bit game console that they hoped would take over as the new industry leader. A year later, Panasonic marketed the console; although reviews were positive, the price (at \$699) was not. Atari responded by jumping ahead to a 64-bit console system with the release of the Jaguar. Sega responded by releasing the 32X, a peripheral device that enabled the Genesis to run a new set of 32-bit cartridge games.

Since the Saturn was outselling Sony's PlayStation in Japan, it was assumed that the Saturn would also do well in the United States. After announcing that the system would be released in the United States on "Saturnday"—September 2—Sega released the system four months earlier than expected. Overall, sales were low and few titles were released—primarily because developers were caught off guard by the early release. Although the system continued to do well in Japan, sales remained disappointingly low in the United States. By 1996, rumors persisted that the company would stop developing hardware and focus on game software.

Sony Computer Entertainment America



The launch of Sony's original PlayStation started a new era in the console wars.

In 1997, Sega announced its merger with Japanese toy company Bandai—which, ironically, was developing software for the PlayStation. After Bandai's board approved of the merger, internal dissent ultimately caused Bandai to reverse its decision. In 1998, Sega launched the Dreamcast, which used Microsoft's Windows CE operating system—allowing for easier game conversions to and from the PC. Even with the success of this release, President Hayao Nakayama stepped down from his position and Sega ceased distribution of the Saturn in the United States.

The entry of Sony's PlayStation into the console market in 1995 launched a new era in the console wars. Even with the release of industry leader Nintendo's N64, the PlayStation kept its spot as the number one worldwide next-generation game console. In 1997, Sony and Nintendo continued competing with the PlayStation and N64.

The “Big Three” Console Wars

The console wars involving the “big three” (Sony, Microsoft, and Nintendo) emerged in 2000 with the launch of Sony's PlayStation 2 (PS2)—which became the fastest selling console in history, with over 100 million units shipped by 2006. Nintendo's GameCube and Microsoft's Xbox joined the new console war in 2001 and 2002, respectively. The GameCube focused on a younger (primarily early childhood and pre-teen) market, and the Xbox's emphasis on performance and features attracted the “hardcore” gamer population.

Sony Computer Entertainment America

Nintendo

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The PlayStation 2, GameCube, and Xbox consoles were manufactured by Sony, Nintendo, and Microsoft, respectively (the “Big Three”).

A new generation of systems from the “big three” currently vie for attention in the marketplace—Microsoft’s Xbox 360, Nintendo’s Wii, and Sony’s PlayStation 3 (PS3). We will explore these systems in more detail in Chapter 2.

FoxTrot by Bill Amend
Courtesy of Universal Press Syndicate



The Personal Computer Revolution

During the mid-1970s, another segment of the electronic gaming industry began to enter a new era. The personal computer revolution brought technology that was once the exclusive territory of programmers and hobbyists into the home. Games that had once been developed on a whim by university students could now be adapted for personal computers—and the general consumer would get to join in the fun. Already, arcade games were being repurposed into home game systems, taking some of the business away from video game arcades. The growth of computers in the home also contributed to the eventual decline of the arcade business—and it also represented a threat to the game console business. Several personal computers—such as the Apple II and Commodore 64—were created with gameplay in mind. (In fact, Steve Wozniak, who designed the Apple II, was an avid gamer.) As you read this section, think about the first personal computer your or your family owned and what games you liked to play on it.

Mainframes & Text Adventures

Colossal Cave (also known as *Adventure*—not to be confused with the Atari VCS game of the same name) was developed by assembly-language programmer William Crowther and influenced a generation of adventure game developers at colleges and defense contractors. Donald Woods expanded on it, resulting in Infocom's popular *Zork* in 1979. The two-word commands, which originally were developed by Crowther so that his young daughters would understand them—were immortalized in ZIL (Zork Interpretive Language)!

||||| *Colossal Cave*: Text Addiction

Will Crowther

```
PAUSE INIT DONE statement executed
To resume execution, type go. Other input will terminate the job.
go
Execution resumes after PAUSE.
WELCOME TO ADVENTURE!! WOULD YOU LIKE INSTRUCTIONS?

.
SOMEWHERE NEARBY IS COLOSSAL CAVE, WHERE OTHERS HAVE FOUND
FORTUNES IN TREASURE AND GOLD. THOUGH IT IS RUMORED
THAT SOME WHO ENTER ARE NEVER SEEN AGAIN. MAGIC IS SAID
TO WORK IN THE CAVE. I WILL BE YOUR EYES AND HANDS. DIRECT
ME WITH COMMANDS OF 1 OR 2 WORDS.
(ERROS, SUGGESTIONS, COMPLAINTS TO CROWTHER)
(LIF STUCK TYPE HELP FOR SOME HINTS)

.
YOU ARE STANDING AT THE END OF A ROAD BEFORE A SMALL BRICK
BUILDING . AROUND YOU IS A FOREST. A SMALL
STREAM FLOWS OUT OF THE BUILDING AND DOWN A GULLY.
```

Author Jeannie Novak's father, who was a mathematician for a defense contractor, often brought his work home with him; this sometimes included a terminal with a 300-baud modem attached to it, which is about 100 times slower than a sluggish modern dial-up connection! Playing *Colossal Cave* involved using two-word commands such as "go west" and "get inventory." As simple as this sounds, the game was highly addictive—and the lack of graphics allowed the imagination to run wild.



Other mainframe games included:

- Richard Greenblatt's *MacHack-6* (1966)—the first computerized chess program to enter a tournament (and beat a human player). The program was an expansion of Alan Kotok's BS project on the IBM 7090.
- John Horton Conway's *Life* (1970)—a cellular automata-artificial life program that allowed the "player" to set rules and watch what happened to computer-based "life-forms" as they evolved. Software Toolworks later released *Life* for personal computers.
- Don Daglow's *Trek* (1971)—a very popular *Star Trek*-like sci fi game that began on the Pomona College mainframe. Cygnus Software later released *Star Fleet I* (a "slick" version of *Trek*) for personal computers.
- Gregory Yob's *Hunt the Wumpus*—incorporated a maze based on a dodecahedron (12-sided polygon). Players explored this "map" and attempted to kill the Wumpus (an odorous beast who hid in caves surrounded by pits and superbats). The beast remained asleep until unwary adventurers awakened it by firing an arrow and missing. If the Wumpus ended up in the same room as the adventurer, it ate the adventurer. During the game, the adventurer received clues about how close in proximity the Wumpus was (based on the strength of the creature's odor).

IBM PC: the “Business Machine”

In 1981, IBM released the IBM PC using Intel’s 8088 microprocessor. Although the system was not targeted toward the business and programming communities—and it was not designed for entertainment—it ended up capturing the market for computer programmers (including game developers) because IBM used an open system architecture and allowed itself to be cloned. Today, personal computers based on the original IBM technology are the standard hardware used by computer game developers and players.

Boffy b (Wikipedia Commons)



Apple II

While at Hewlett-Packard, Steve Wozniak designed what eventually became known as the Apple I and demonstrated it at the Homebrew Computer Club—a popular computer hobbyists’ hangout. Steve Jobs approached him at the meeting and suggested that they start a company together. The result was the first personal computer system—and the beginning of a revolution that threatened to compete with video arcades and home consoles alike. Computers were out of the exclusive realm of university and research engineering students and hobbyists, and into the home.

Steve Wozniak implemented the BASIC programming language into what he called “Game BASIC” to develop games for the Apple II. Consumers could program the system as well, or play games such as *Zork*, *Lode Runner*, *Wizardry*, and *Ultima*.

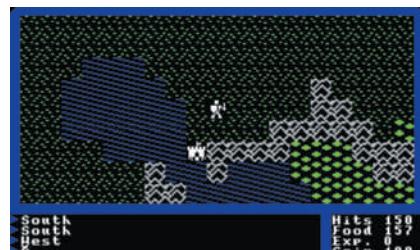
In 1984, Apple released the Macintosh—a system with superior graphics, sound, and an accessible, user-friendly interface. A year later, Microsoft released the Windows operating system to compete with the Macintosh. Although Windows eventually grabbed a majority of the market share, the initial releases of the operating system were weak.



Apple Computer, Inc.

The first home computer games were played on the Apple II.

Electronic Arts



Ultima I is the first of nine games in the popular *Ultima* series.

::::: *Ultima's Origin*

In 1979, Richard Garriott's California Pacific Computer (later Origin Systems) released *Akalabeth*—the precursor to the popular *Ultima* series. A year later, a tile-based graphics version of *Ultima* was released for the Apple II. After seven sequels, the highly successful adventure/role-playing game series continues with *Ultima Online*.

Electronic Arts: Star Power

Former Apple employee Trip Hawkins later started what became one of the largest game companies in the United States: Electronic Arts. Initially treating his designers and artists like “rock stars,” he referred to game packaging as “album covers” and sent his developers on in-store game signing tours. Hawkins’ later decision to focus his attention on celebrity advisors in the sports industry helped make sports the top-selling game genre in the United States—with titles such as *Dr. J and Larry Bird Go One-on-One* and the ever-popular *John Madden Football*. (EA’s success was arguably built on the sports games it made for the Sega Genesis. The company’s experience with the Amiga gave it a leg up when creating games for this console.)

Atari Interactive, Inc.



The Atari 400 was a hybrid computer-game system.



::::: From Console to Computer

Atari shifted its focus to compete directly with Apple by releasing the 400 (a game machine that was also a computer), 800 (with a real keyboard and internal expansion capability), and 5200 (a pure game machine—but it did not handle 400 or 800 cartridges). Coleco also tried to compete with Apple by releasing the unsuccessful Adam Computer. Not only did this effort detract from the ColecoVision console system, but 60 percent of all Adam Computers were returned defective.

CDTV: Commodore's Edutainment System

In 1990, when companies such as Davidson & Associates, the Learning Company, and others launched the “edutainment” computer software movement, Commodore released the CDTV (Commodore Dynamic Total Vision)—a home entertainment system that was basically a Commodore 64 without a keyboard. This “interactive” system was one of many released at the time that stressed educational software as well as games. The software was sold on CDs rather than cartridges.

Commodore 64

After releasing the PET (Personal Electronic Transactor) and the VIC-20 to compete with the Apple II (and failing to do so), Commodore Computer made another attempt to enter the personal computer market in 1982. This time, the company was successful beyond belief. The affordable Commodore 64 (C-64), released in 1982, was a formidable competitor to the more expensive Apple II. In fact, the C-64 was one of the most successful computers of all time. Its \$300 price tag (equivalent to Intellivision) and programmability made personal computing affordable. Its color monitor and spacious memory made rival computer Texas Instruments' TI-99 look primitive. Software continued to be developed for the Commodore 64 into the next decade. Commodore also released the Amiga computer in 1986; designed to support high-end games, the Amiga was an exceptional platform but was marketed poorly.

Commodore Computers



The Commodore 64 made personal computing affordable.

Sierra On-Line: Leading the Pack in Computer Game Development

New game companies were launched that created software only for home computers instead of arcades and consoles. Inspired by *Colossal Cave*, Roberta Williams started Sierra On-Line with her husband Ken; most of the team's game development was done at the kitchen table! In 1984, Sierra released *King's Quest*—a graphical adventure/role-playing game targeted for IBM's PC Jr. The game became a successful and long-running series.

Sierra Entertainment



One of the first graphical computer adventure games, *Mystery House* launched Sierra On-Line

Before the personal computer revolution even began heating up, innovations in the online world were going strong—among those fortunate enough to have access to the online world. It took the emergence of networked gaming—and especially the commercialization of the Internet—to break open this world for the consumer public. Until the introduction of the World Wide Web in 1993, playing personal computer games was mainly an isolated activity. Let's look at the evolution of online games—an industry segment that began with a small, elite market decades before personal computers took over home entertainment.

Multiplayer Meets the Online Elite

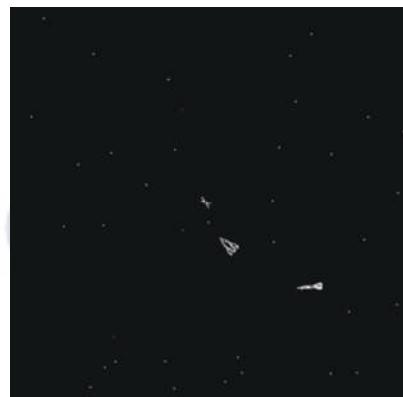
You might think that online games began when the Internet became commercial, attracting a wide market of consumers. In reality, online games pre-dated this era by several decades. In the early days of online gaming, players had access to technology that was not readily available to the public. As a result, networked games evolved away from the public eye—and they really did not get public attention until the World Wide Web came into consumer use.

The following are a few milestones in the history of online gaming. You might recognize some of the services that helped fuel this segment of the industry. In fact, you might even be using at least one of them today!

PLATO

It all started with PLATO (Programmed Logic for Automatic Teaching Operations), introduced in 1961 at the University of Illinois. The system was intended to be used for research in the area of computer-based education, but Rick Blomme turned it

Atari Interactive, Inc.



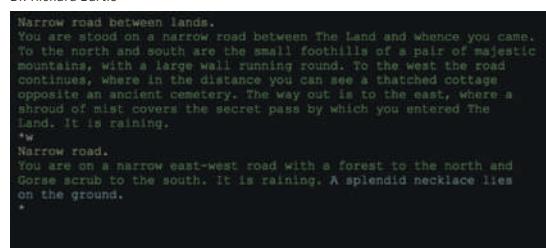
The mainframe game that started it all—*Spacewar!*

into a multiplayer game network. Creating a two-player version of *Spacewar!*—Steve Russell's MIT mainframe game that started it all—Blomme catalyzed the growth of a new phenomenon in gaming. PLATO soon introduced a *Star Trek*-based game for 32 players (*Empire*), a flight-simulation game (*Airfight*), and a popular precursor to today's chat rooms known as *Talk-O-Matic*—foreshadowing the importance of social interaction in online games. In the 1970s, PLATO featured *Dungeons & Dragons*-inspired *Avatar* (origin of the *Wizardry* series) and *Oubliette*. This was the beginning of what became online role-playing games—which are now played on a “massive” scale, with thousands of simultaneous players. It was also the beginning of many educational games and interactive experiments.

MUDs

Roy Trubshaw and Richard Bartle at Essex University (U.K.) created what later was referred to as a Multi-User Dungeon (MUD) in 1978. As the Essex network became

Dr. Richard Bartle



MUD1, considered to be the oldest virtual world in existence, was created by Richard Bartle and Roy Trubshaw in 1978.

a part of ARPAnet—a worldwide computer network of academic institutions and the basis of what is now known as the Internet—students and researchers connected to the network began creating their own MUDs with the freely available code. Like *Talk-O-Matic* and future online chat rooms, MUDs focused heavily on the social aspects of games. This, and the ability for players to design their own environments, helped build social interaction and player design into the online game tradition.

CompuServe

CompuServe, the first Internet service provider (ISP), immediately recognized the monetary potential of allowing its customers to play games over a public network. Teaming up with developers John Taylor and Kelton Flinn of Kesmai Corporation, CompuServe released ASCII-text role-playing games such as *Islands of Kesmai* and *Megawars I*. Charging its customers a whopping \$12 per hour (even more expensive primetime at \$25–65) to play these games, CompuServe launched commercial online gaming.



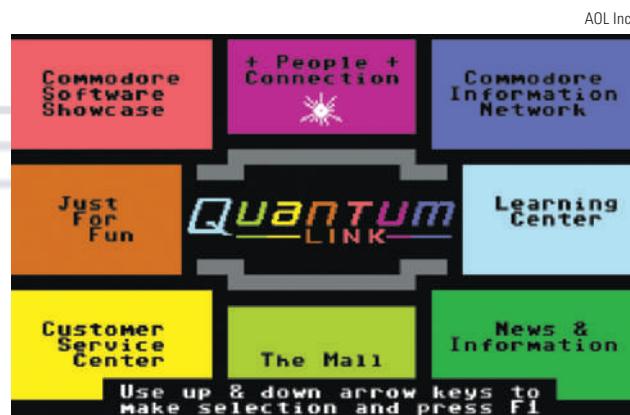
CompuServe®

The First Monthly Game Service

Marc Jacobs provided the first online gaming service for a monthly rate (\$40) with the text-based role-playing game called *Aradath*. Jacobs' company, AUSI, was the predecessor to Mythic Entertainment—the developer of *Dark Age of Camelot*.

Quantum Link

America Online (AOL) actually started as a game company. The predecessor of today's AOL was launched in 1985 to directly compete with CompuServe's online multiplayer game services. The first graphics-based online service, Quantum Link, was initially available only to Commodore 64 users. The first game available on the service—developed by Randy Farmer and Chip Morningstar at LucasFilm—was *Habitat*, the first graphics-based MUD online environment that focused on social interaction. Richard Garriott of Origin Systems approached Quantum Link in 1991 to develop *Ultima Online*—an online version of the successful *Ultima* series.



Why Not Play-By-Email?

Play-by-mail (PBM) games such as *Diplomacy* (which began in the 1960s) were developed as a way for geographically separated gamers to compete with each other. With the advent of online services such as GEnie and QuantumLink (AOL), pioneers Don Daglow and Jessica Mulligan launched the first commercial play-by-email (PBEM) games. Chat-based multiplayer space strategy game *Rim Worlds War* was developed by Jessica Mulligan for the GEnie online service. *Quantum Space* was designed and programmed by Don Daglow for QuantumLink (AOL).

GFnie

The GE Network for Information Exchange was an online service that competed directly with CompuServe and Quantum Link. Kelton Flinn of Kesmai Games developed *Air Warrior* for GEnie. *Air Warrior* was a groundbreaking World War II flight simulator that could be considered the first graphically based massively



During the late 1980s, GEnie established itself as the premier online service for multiplayer online games.

multiplayer online game. During the late 1980s, GEnie established itself as the premier online service for multiplayer online games—licensing game environments such as AUSI's *Galaxy II* and Simutronic's *Orb Wars*. The first commercial online 3D shooter, *A-Maze-ing*, was launched in 1989. (In 1974, Dave Lebling and Greg Thompson wrote a multiplayer first-person shooter called *Maze* for the Imlac PDS-1, with PDP-10 as a server. It supported up to eight players, chat, and bots.)

 id Software: Revolutionizing Networked Gaming

In 1993, several events took place that helped accelerate the online multiplayer game segment. The first graphical web browser, NCSA Mosaic (created by Mark Andreessen while he was a student at the University of Illinois) marked the end of text-only communication on the Internet—opening up this global network to the commercial world, as well as to the general public. The commercial online service competed for subscribers. Then, in 1993, id Software released *Doom*—which allowed up to four players to connect over a LAN (local area network) and play against each other in a “death



Doom helped commercialize networked gaming.

match." The company's next title, *Quake*, featured built-in Internet capabilities so that geographically dispersed players could engage in death matches. Other computer game developers added modem and LAN functionality to games that allowed for simultaneous players. Yet another entirely new section of the computer game market was created, involving CD-ROM products being played over networks. Built-in, Internet-based multiplayer capability also became a requirement with games—rather than an option.

::::: The LAN Party Phenomenon

The 1990s saw major developments in computer graphics, processing speed, and sound—and computer games were raised to new standards. Networked multiplayer games such as *Doom*, *Quake*, *StarCraft* and *Diablo* spawned a new social trend among gamers. “LAN parties” involved friends networking their computers together in a room and playing in teams or against each other—in between bites of pizza and (root) beer.



::::: The Saga Continues in the Online World

The rise of massively multiplayer online games (MMOs) in the United States began when Origin Systems launched *Ultima Online*—hitting the 50,000-subscriber mark within the first three months. Turbine Entertainment developed *Asheron's Call*, and Verant Interactive (later acquired by Sony) launched *EverQuest*—which became the largest massively multiplayer online role-playing game (MMORPG) in the United States, claiming to have over 500,000 simultaneous players. (MMOs are discussed in more detail in Chapter 3.)



Ultima Online (left) and *EverQuest* (right) were two of the first massively multiplayer online games (MMOs).

As the information revolution, fueled by the World Wide Web, infused American culture in the mid 1990s, computer games became truly interactive—with the capacity for hundreds of thousands of people worldwide to play “massively multiplayer” games simultaneously. Players immersed themselves in a simulated, persistent fantasy world—customizing their own characters, forming collaborative teams or “guilds,” and engaging in adventurous quests.

Mobile & Handheld Games: Nomadic Culture

Other segments of the industry are starting to experience growth. The portable game business—first seen in the 1970s with Mattel’s sports-oriented handhelds—has evolved into a full-fledged mobile game market. Digital download services have also helped make games much more available to players worldwide.

Nintendo



Nintendo revolutionized the handheld industry with the Nintendo DS—a dual-screen system with Wi-Fi and local wireless capabilities. Past models in the series include (left to right) the original DS (2004), DS Lite (2006), DSi (2009), and DSi XL (2010).

Sony Computer Entertainment America



Sony's PlayStation Portable (PSP) was the first portable game console to launch with games supporting online play. Past models in the series include (left to right) the original PSP-1000 (2005), PSP-2000 (2007), PSP-3000 (2008), and PSPgo (2009).

David Carr (Wikipedia Commons)



Nokia, Inc.



The Nokia 6110, released in 1997 (left), was the first cell phone to include a pre-installed game (*Snake*). Nokia's N-Gage, released in 2003 (right), was an early attempt at a multi-purpose cell phone/game/MP3/Internet-based system.

Developers and hardware manufacturers are jumping on the bandwagon and putting together portable gaming development initiatives (Sony's PSP), creating innovative motion-sensing hardware (Microsoft's Kinect and Sony's Move)—and experimenting with techniques that address the graphics, memory, and screen size limitations (mobile and handheld devices). See Chapter 2 for a detailed discussion of current game platforms.

Convergence: Industry Segments Come Together

After decades of developing in parallel, the console and computer game segments began experiencing some technology convergence—where characteristics of once-separate industry segments intersect. This has been fueled by an unexpected development involving online games. The online world has become a popular place for communication and entertainment. Console game companies, in their desire to grab this market, now offer Internet connectivity through their systems: Xbox 360 (Microsoft), PlayStation 3 (Sony), and Wii (and its successor, the Wii U—from Nintendo).

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Sony Computer Entertainment America

Nintendo



The three current dominant console systems—Xbox 360, PlayStation 3 (PS3), and Wii—all offer online multiplayer games, browsing, and transactions through Internet connectivity.

Convergence is the theme for most newer portable and console systems—whether they connect to the Internet or incorporate cell phone technology. The current generation of console systems has pushed the notion of convergence to new levels. The Xbox 360, PS3, and Wii not only connect to the Internet (some through very usable browsers), but they allow players to connect to each other and purchase games and HD movies. (See Chapter 2 for more specs on current portable and console systems.)



Galaxy S2 (Android phone), iPhone, iPad, 3DS, and PlayStation Vita

Emulators: The Online Arcade

Even arcade and online worlds are converging in the form of online arcade emulation programs—which duplicate the function of one system with a different system, so that the second system appears to behave like the first. For example, the MAME (Multiple Arcade Machine Emulator) software emulator allows computers to run arcade games on computer hardware. One of the more creative is a *Pac-Man* emulation that was programmed through an Excel spreadsheet! A popular use of emulators is to run games written for hardware that is no longer sold or readily available—not only arcade hardware, but console and computer hardware (such as Commodore 64 and Amiga). The Nintendo Wii has a Virtual Console functionality (NES, SNES, Genesis, and TG-16), and compilations are now common (such as the Sega Genesis Collection for PS2/PSP).

Into the Future

You have taken a brief look at major milestones in the history of electronic game development. Where do you think the industry will be 10 years from now? Do you sense another industry segment beginning to bubble under the surface? Will one particular segment experience a growth spurt? Will another touted segment fail? Will consumers choose portability over the cinematic experience of home theatre-style console gaming? As the mobile gaming industry continues its rapid climb, will developers start to focus overwhelmingly on the small screen? Will the social aspects of online multiplayer games become so compelling that players will spend more time in the virtual environment than in RL (“real life”)—or will they integrate both worlds successfully through augmented reality or an as yet unknown technological breakthrough? Throughout the rest of the book, you’ll have the opportunity to form your own opinion on these possibilities.

This chapter introduced you to the history of electronic game development—covering the companies, people, and games that helped this industry take shape. In the next chapter, we’ll take a more thorough look at current game console, mobile, handheld, computer, and arcade systems. As you read the chapter, consider how these systems and the number of players using them simultaneously might affect the way a game is developed and played.

Expanded assignments and projects based on the material in this chapter are available on the Instructor Resources DVD.

...CHAPTER REVIEW EXERCISES...

1. What are the key phases and milestones in the history of electronic game development? How has convergence played a role in connecting these phases?
2. Why have some game development companies succeeded while others have failed? How can you apply this knowledge to the current industry?
3. What electronic games helped attract a larger audience to the industry? Why did they succeed in doing so?
4. What traditions in early game development are still in existence? How are they appealing and useful to developers and players?
5. Several theories have been used to explain the decline of the arcade industry and associated video game slump of the early 1980s. Do you agree with any of these theories in particular? Do you have a theory of your own? Is there anything that could have been done to prevent this slump?
6. What was the first electronic game you ever played? Did it capture your attention? Why? What are some non-electronic games that were popular when you were a kid? Do you feel that the thrill of any of these games has been captured in digital form?
7. Choose a time in the history of electronic game development, and pretend you are a developer working in the industry. Knowing the limitations of the time, what type of game would you create?
8. You've read about the many eras and phases of the electronic game industry. Are we at the dawn of a new era? Can you predict the primary features of the next phase in game industry history?