

The Birth and Development of Sports Video Games From the 1950s to the Early 1980s

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This article provides an overview of the origins and early development of sports video games. The first generation of sports video games were developed by scientists in laboratories for academic purposes. Together with the rise of microcomputers and the widespread adoption of television (TV) sets, commercial video games began to emerge in the early 1970s. Like their laboratory predecessors, most of the first-generation commercial games were sports-themed and primarily designed as a platform for competition between players. In the second half of the 1970s, ball-and-paddle-based games began to be replaced by more sophisticated games adopting the rules and actions of real-life sports. By the late 1970s and early 1980s, intense competition between video game companies gave birth to many innovative titles, with various sports disciplines adapted into games. Most of the sports games created in this period were based on competitive sports including American football, basketball, baseball, soccer, and tennis, as well as recreational sports like bowling, pool, and darts, many of them long popular in Western Europe and North America, some with a huge fan base in Japan. They were clearly produced to cater to the needs of gamers and sports fans in the world's three major TV, personal computer, video game, and sports markets at the time.

Keywords: arcade, console, computer, history

It has been over seven decades since the first video games were created in laboratories in the United States and the United Kingdom. With the arrival of the electronic and computer age, video games have evolved into a unique form of entertainment, a hobby, a social platform, and a special cultural phenomenon. Due to this overwhelming popularity, and considering the growing impact on society, researchers from fields including computer science, sociology, philosophy, psychology, media, and communication have begun to study video games and related phenomena. Among all the subfields of game studies, game history has always been an attractive and welcoming topic for both researchers and general readers. Understanding games' past allows us to suggest an agenda for the future and

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“consider how and to what end we preserve video game culture.”¹ It also provides a foundation for other research to build upon.²

The current literature on game history can be divided into three categories: the development of the video game industry; the rise and fall of individual video game companies; and the evolution of game software and hardware. The first examines video games and the game industry from business and cultural perspectives, exploring the dawn of computer, arcade, and console games in the second half of the twentieth century, and their rise into a multibillion dollar business in the new millennium. For example, Herz’s *Joystick Nation* gives an overview of video game history and discusses the cultural and social impact³; and Poole’s *Trigger Happy* traces the history of various genres of games and explains from a philosophical perspective why they became a popular form of entertainment.⁴ These two pioneering works were followed by Kent’s *The Ultimate History of Video Games*, published in 2001. Based on interviews with hundreds of game industry luminaries, the book chronicles the industry’s first thirty years, telling the stories of leading game companies such as Atari, Nintendo, Sega, and Sony, and the iconic games and consoles that they created.⁵ The following years saw the emergence of more publications of this kind, including Donovan’s *Replay*, Stanton’s *A Brief History of Video Games*, and Chris Kohler’s *Power-Up*. Kent went on to publish volume two of *The Ultimate History of Video Games* in 2021, covering the development of the game industry and the rivalry between major game companies over the past two decades, making this two-volume book one of the most comprehensive works on video game history.⁶

The second category of literature focuses on leading players in the industry. For instance, *Once Upon Atari*, by game designer Howard Scott Warshaw, tells the behind-the-scenes story of the early days of the video game industry through the author’s personal experience as an Atari employee. Sheff’s *Game Over, Press Start to Continue* and Ryan’s *Super Mario* explore Nintendo’s games and consoles, and explain how the company rose to become a major player in the video game industry. Harris’s *Console Wars* describes the rivalry between Nintendo and Sega, and reviews their marketing and business strategies during the 1990s.⁷

The third category of published work concentrates on the games themselves. Some titles explore popular games of various genres and different generations of game consoles in chronological style. Hansen’s *Game On!* and Kushner’s *Masters of Doom* are the two best-known.⁸ The former delivers an overview of the growth and evolution of video games through the lens of thirty-eight best-selling games from different eras, while the latter offers a detailed account of the creation of pioneer first-person shooter games *Wolfenstein 3D* (1992), *Doom* (1993), and *Quake* (1996). Matt Barton’s *Dungeons and Desktops* is another important publication of this kind. It was one of the first academic works to explore the history of a particular game genre—computer role-playing games—explaining the creation and development of influential titles such as *Ultima* (1981) and *World of Warcraft* (2004).⁹

Generally speaking, in the academic field of game studies, the history of, and around, games is still a novel research topic. Unlike previous and current publications that either look at games and the game industry as a whole or focus on a specific game, console, or company, this article focuses solely on sports/sports-themed games. The objective is threefold: (a) to provide a holistic view of

the full variety of early sports video games, from the birth of mainframe computer games in the 1950s to the rise of the first generation of commercial video arcade, home console, and computer games in the 1970s, ending with the North American video game crash of 1983; (b) to highlight the influence of technology advancement and industry competition on the development of game design and marketing, rather than briefly review early sports video games in chronological order; and (c) to provide some insights on the historical process of interaction and integration between real-world sport and video games.

Gifts From Laboratories—Precursors to Video Games

The history of video games can be traced back to 1947, when American television (TV) pioneers Thomas T. Goldsmith Jr. (1910–2009) and Estle Ray Mann (1904–1965) devised and patented the world’s first electronic video game system, the Cathode-ray Tube Amusement Device, which used a cathode-ray tube (CRT) beam to simulate a flying missile.¹⁰ At the same time, with the arrival of the first programmable electronic digital computers, such as the Electronic Numerical Integrator and Computer created at the University of Pennsylvania in 1945 and the Electronic Delay Storage Automatic Calculator constructed at the University of Cambridge in 1949, scientists in the United Kingdom and the United States began to produce game programs for research purposes. In 1948, British mathematician and logician Alan Turing (1912–1954), the founding father of modern computer science and artificial intelligence (AI), and his friend David Champernowne (1912–2000) jointly devised a system of theoretical rules to calculate and determine the moves in a chess game, known as Turochamp. The program was designed to function as an AI in a chess match against a human player. Around the same time, American mathematician and electrical engineer Claude Shannon (1916–2001), then a researcher at Bell Telephone Laboratories in New Jersey, presented his idea for a computer chess game in a paper entitled “Programming a computer for playing chess” at the 1949 National Institute for Radio Engineers Convention in New York. The details of the design were later published in *Philosophical Magazine*.

Meanwhile, technology firms in North America and the United Kingdom started to produce dedicated, displayable computer gaming systems for exhibition and advertising purposes. In 1950, commissioned by Canadian vacuum tube company Rogers Majestic, Austrian–Canadian electrical engineer Josef Kates (1921–2018) built Bertie the Brain, which allowed a human to play tic-tac-toe against a computer. The four-meter tall machine was labeled “The Electronic Wonder by Rogers Majestic” and displayed at the 1950 Canadian National Exhibition in Toronto.¹¹ One year later, in order to showcase its latest digital computer technology, British electrical engineering company Ferranti built a vacuum tube-based computer, the Nimrod, to play the mathematical table game Nim. Advertised as an “electronic brain” that was “faster than thought,” it was exhibited at the 1951 Festival of Britain as a replacement for the Ferranti Mark I—the world’s first commercially available programmable electronic computer. Visitors, including Alan Turing, were invited to play the game during the exhibition.

That same year, inspired by Turing, colleague Dietrich Prinz (1903–1989) wrote a limited chess program and successfully implemented it on the Ferranti Mark 1 in November 1951.¹² Also in 1951, British computer scientist Christopher Strachey (1916–1975) tried to develop a draughts/checkers program for the pilot Automatic Computing Engine computer at the U.K. National Physical Laboratory. With Turing’s encouragement and support, he ported the game to the Ferranti Mark I computer at the Victoria University of Manchester. The upgraded game pitted a player against the computer, with game progress shown on the Ferranti Mark I’s Williams Tube displays. By the summer of 1952, the program was able to “play a complete game of Draughts at a reasonable speed.”¹³ It was later listed by Guinness World Records as the “first video game” in history.¹⁴

While scientists in universities, research labs, and technology companies were busily engaged in making simulations of board games on the first generation of programmable digital computers, in 1954 University of Michigan researchers William Brown and Ted Lewis, both avid pool players, took a different approach and developed a pool game for the Michigan Digital Special Automatic Computer at the Willow Run Research Center. The game was displayed on a thirteen-inch CRT screen, with graphics showing sixteen balls and a two-inch pool cue. The border of the table and the pockets were drawn manually onto the screen surface using a grease pencil (see Figure 1). Players used an analog joystick, a rotational knob, and a button to control the position and angle of the cue stick, and pressed a



Figure 1 — Willow Run Research Center, MIDAC Computer, 1954. Caption reads: “Schematic Diagram of Computer Operation in Pool Game Simulation.” Source: Courtesy of University of Michigan.

button to strike the cue ball. The computer then made 25,000 calculations a second to determine the speed, trajectory, and bounce angle of the cue ball and all other fifteen balls when they collided with each other or hit the edge of the pool table, with a ball disappearing from the screen if it fell into a pocket. All this was displayed in real time, making it the earliest known computer game to feature real-time graphics and the first computer simulation of a recreational sport.¹⁵

A couple of years later, in order to introduce modern science and technology to the general public in an interesting way, American physicist William Higinbotham (1910–1994) created another sports game, *Tennis for Two*, at New York’s Brookhaven National Laboratory (BNL). The game used a CRT beam spot to simulate a tennis ball traveling back-and-forth over a net in the middle of a five-inch converted oscilloscope screen, with the speed and path of the ball calculated by a computer.¹⁶ Two analog controllers, each with a flat side to hit the ball and a knob to adjust the angle of the shot, were used. Players followed basic tennis rules, winning or losing a point when the ball hit the net or bounced twice on one side of the court.¹⁷

Tennis for Two was introduced to the general public at BNL’s annual exhibition in October 1958. It then received upgrades and was displayed to the public again on a larger screen at the 1961 exhibition.¹⁸ Higinbotham highlighted the educational and social values of the game: “It might live up the place to have a game that people could play, and which would convey the message that our scientific endeavors have relevance for society.”¹⁹

By the early 1960s, vacuum tube mainframe computers were increasingly available in universities, research labs, large technology firms, financial institutions, and government agencies in the United States. More and more researchers and students began to write game programs for them, giving rise to different types and genres of games. These included board game *Kalah* (1961), developed by Roland Silver of Bolt Beranek and Newman for the Digital Equipment Corporation (DEC) programmed data processor-1 (PDP-1), and programming game *Darwin* (1961), developed at Bell Labs for the IBM 7090 mainframe.²⁰

In 1961, John Burgeson (1931–2016), a baseball fan and programmer at IBM in Akron, Ohio, created a program called *BBC Vik: The Baseball Demonstrator* for the IBM 1620 scientific computer. This baseball simulation allowed the gamer to select nine players for the visiting team, from a roster of ninety all-stars. The computer then picked the home team and ran the game by using its database to calculate each batter’s batting average and right/left batting stance. A complete game lasted seven to eleven minutes,²¹ with information about the two teams and each game event printed by the typewriter. Figure 2 shows an example of printed results.²²

Burgeson submitted this first computer baseball game to the IBM library, but some of the managers in IBM headquarters believed that the \$120,000 computers were for data processing, not gaming, and insisted that it be removed. Burgeson managed to convince them to keep the game as free demonstration software for the 1620. He recalled in 2012: “I thought there’s room for games, too. So I wrote back and I said, ‘Actually, my brother Paul helped write it, and he’s an IBM customer!’ Well, they read that and they had to keep it in there If you buy this machine, you’ll get free programs for linear regressions, curve fitting, and managing your own baseball team!”²³ This pioneer baseball simulation also attracted the attention

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VISITORS
NAME                TEAM          AVG BATS
RUTH                LF           1923 YANKS   .399 L
CROSETTI            SS           1936 YANKS   .288 R
HEGAN               C            1947 CLEVE   .249 R
...

HOME TEAM
NAME                TEAM          AVG BATS
BROUTHERS          1B           1887 DETROIT .419 L
KAMM                3B           1928 W SOX    .308 R
TRAVIS              SS           1941 WASHING .359 L
...

TOSKY UP           HOMER TO RIGHT
GORDON UP          GROUNDER TO PITCHER
WANGER UP          DOUBLE TO CENTER
WILLIAMS UP        DOUBLE TO R CENTER RUNNER SCORES
SPEAKER UP         SHORT FLY TO LEFT
GROVE UP           GROUNDER TO THIRD

2 RUNS 3 HITS 0 ERRORS

KAMM UP             LONG FLY TO R CENTER
TRAVIS UP           INF. HIT TO THIRD
MEDWICK UP          RUNNER STEALS SECOND
  LINE DRIVE TO Picher DOUBLE PLAY

0 RUNS 1 HITS 0 ERRORS

END OF 9 SCORE 2 0

GAME COMPLETED.   TOTALS
VISITORS            02 10 00
HOMETEAM            00 06 01

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Figure 2 — Game results of *BBC Vik: The Baseball Demonstrator*.

of the KDKA Pittsburgh radio station. In autumn 1961, it produced a short-lived show based on the game's output, with radio personality Regis Cordic calling out the play-by-play as in a live baseball broadcast—a landmark in the history of both computer games and sports broadcasting.

Space shooting game *Spacewar!* was another important mainframe game created in the 1960s. It was developed at Massachusetts Institute of Technology and realized on a PDP-1 minicomputer produced by DEC in 1962, simulating a battle between two spacecraft, each controlled by a player using PDP-1's test-word toggle switches to adjust the heading and thrust of the spaceship and fire missiles at the opponent's ship.²⁴ The game soon became well-known among researchers and students, and was introduced to colleagues in other universities as well. DEC engineers also used the game as a test program for newly built PDP-1 computers and for demonstrating the sophisticated graphical capabilities of the system.²⁵ In the following years, students and researchers continued to make variations of *Spacewar!*, adding new features such as multiple ships, partial damage, score-keeping, space mines, and stealth capability.

Spacewar! was the first widely played video game; it also gave birth to the first documented sport competition-like video game tournament, the Intergalactic Spacewar Olympics. The event was held at Stanford University's Artificial Intelligence Laboratory on October 19, 1972. It was proposed by *Rolling Stone* magazine's sports reporter Stewart Brand, who believed that the game was a

“flawless crystal ball of things to come in computer science and computer use.”²⁶ Some twenty researchers and students gathered in the lab that evening and competed in a preliminary 2v2 team competition, a singles competition, and a final five-player “free-for-all” match on a PDP-10 computer, with the winners receiving the prize of a one-year subscription to *Rolling Stone*. Brand recalled an “athletic exuberance”²⁷ to the participants’ joyous play and praised *Spacewar!* as a delightful game that bonded human and machine through live graphics display.²⁸ This landmark tournament helped to build up the link between video games and sport in a unique way and was later recognized as the first competitive gaming/esports event in history.²⁹

The Rise of BASIC Sports Games

By the mid-1960s, computers had begun to move into the third generation with the adoption of integrated circuits in place of transistors. Headed by the IBM System/360, the new generation of computers had faster processing speed, was more energy-efficient, and cheaper to manufacture and maintain.³⁰ In terms of software, database systems, distributed operating systems, and high-level programming languages such as BASIC, PASCAL, and FORTRAN became widely used.³¹ Against this background, game development underwent a transformation and interactive sports games began to emerge.

In November 1965, Hungarian-born American mathematician and computer scientist John G. Kemeny (1926–1992), co-creator of the BASIC language, wrote the world’s first American football computer game, *FTBALL*, for the Dartmouth Time Sharing System (DTSS)—an operating system developed at Dartmouth College between 1963 and 1964 which connected hundreds of users through remote terminals in various locations to a central mainframe computer. The text-based game was programmed by Kemeny in BASIC to commemorate Dartmouth’s victory over Princeton in the 1965 Ivy League football championship.³² In gameplay, the player acted as a Dartmouth quarterback and chose from seven options—conservative run play, “tricky” run, short pass, long pass, punt, quick kick, and place kick—with the objective of marching down the field and defeating the Princeton team.³³

The DTSS and BASIC introduced the computer to a much wider audience, and the football simulation game was used to help familiarize beginners with computer applications and programming.³⁴ By 1968 the DTSS library contained over 500 programs, including many games, with baseball among the most popular.³⁵ In subsequent years, an increasing number of text-based games in various genres were created by researchers and students in North America, using BASIC and other programming languages. Influential titles included Doug Dymet’s strategy game *Hamurabi* (1968) and Jim Storer’s simulation game *Lunar Lander* (1969) for the DEC PDP-8 minicomputer, Ken Thompson’s *Space Travel* (1969) for the GE 635 mainframe, and Mike Mayfield’s strategy game *Star Trek* (1971) for the SDS Sigma seven mainframe.

Sports games continued to evolve. In 1971, Don Daglow, an undergraduate liberal arts student at Pomona College in California, wrote the world’s first interactive baseball game in BASIC on a terminal connected to the Claremont

Colleges DEC PDP-10 mainframe. The program was inspired by board games.³⁶ In contrast with *BBC Vik: The Baseball Demonstrator*, which only let players pick a team and watch the computer run a game, it allowed players to manage strategies for individual games, and could simulate an entire season. Detailed text descriptions of each play were printed out, with a lengthy game using up hundreds of pages of paper.³⁷

Also in 1971, DEC employee David H. Ahl converted *Hamurabi* and *Lunar Lander* from the FOCAL language to BASIC to demonstrate the DEC PDP-8 microcomputer. The two games soon became popular among computer enthusiasts, which led Ahl to publish the source code of various computer games in *EDU*, a DEC educational newsletter he edited. Some of the games were written/converted by Ahl, while others were submitted by readers, including many high school students.

Ahl believed that “the educational value of games can be enormous—not only in their playing but in their creation.”³⁸ In response to the growing interest in computer games, he edited *101 BASIC Computer Games*, a collection of games written in six different versions of BASIC. Each game came with a short description, a full program listing, and a sample run, allowing readers to learn game programming in an interesting and effective way. Published by DEC in July 1973, the book was an immediate bestseller that quickly sold out and was reprinted twice, selling 10,000 copies in total—more copies than there were computers at the time.³⁹

All 108 games (101 separate write-ups and seven different versions of another game) listed in the book were text-based, many of them simulating a sports, card, or board game. Others were unique strategy and simulation games. The sports games were *Basketball*, *Bowl*, *Boxing*, *Football*, *Golf*, *Hockey*, and parachute jump simulation *Splat*. Take *Bowl* and *Golf*, for example. *Bowl*, written by Paul Peraino of Woodrow Wilson High School in San Francisco, simulated a bowling game for up to four players. To roll the ball, the player simply typed “ROLL.” After each roll, the computer printed a diagram of the remaining pins and a roll analysis (see Figure 3).⁴⁰ *Golf* was developed by Howard Kargman for the DEC PDP-8 based EduSystem thirty school computer. It allowed up to four players to play up to

SAMPLE RUN

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WELCOME TO THE ALLEY
BRING YOUR FRIENDS
OKAY LET'S FIRST GET ACQUAINTED

WANT INSTRUCTIONS (Y OR N)? Y
THE GAME OF BOWLING TAKES MIND AND SKILL DURING THE GAME
THE COMPUTER WILL KEEP SCORE YOU MAY COMPETE WITH
OTHER PLAYERS UP TO FOUR. YOU WILL BE PLAYING TEN FRAMES
ON THE PIN DIAGRAM 'O' MEANS THE PIN IS DOWN... '+' MEANS THE
PIN IS STANDING. AFTER THE GAME THE COMPUTER WILL SHOW YOUR
SCORES
FIRST OF ALL... HOW MANY ARE PLAYING? 2

VERY GOOD...
PLAYER 1 -- TYPE ROLL
? ROLL
PLAYER: 1      FRAME: 1      BALL: 1

+ + + O
O + O
  O O
  O

```

Figure 3 — Sample run of *Bowl*.

eighteen holes of golf, with the length and par of each hole provided. Each player chose a club, and the computer determined the results of every shot.

Against the background of the rise of the first generation of microprocessor-based home computers in the late 1970s, Ahl edited and published the second edition of *BASIC Computer Games* in 1978. Games in the original book were converted to the Microsoft BASIC devised by Bill Gates and Paul Allen, which had become the standard for microcomputers. The book became extremely popular among the newly emerging home computer community and was translated into multiple languages, becoming the first million-selling computer book in history. Together with the BASIC language, it played an important part in cultivating and inspiring the young generation of computer users and game developers, and helped to lay the foundations for the future development of computer games.⁴¹

Ping-Pong and Its Successors

While BASIC games were gaining popularity among students and researchers in North America, in 1966 electrical engineer Ralph Baer (1922–2014), a division manager at America's leading flexible printed circuit manufacturer, Sanders Associates, started a research project on a TV gaming system.⁴² Funded by the company, his team produced several prototype consoles between 1967 and 1968. The final one, the Brown Box, was based on low-cost diode-transistor logic circuits and was able to display moving squares and a line on an ordinary TV.⁴³

Baer and his team designed seven games for the device: *Ping-Pong*, *Handball*, *Hockey*, *Volleyball*, *Golf Putting*, *Checker Games*, and *Target Shooting*.⁴⁴ The five sports-themed games were all based on ball-and-paddle dynamics. For example, for *Ping-Pong* the TV displayed a vertical line in the middle of the screen to represent the net. Two squares, one on each side of the net, were controlled using dials on the control pad. A third square, controlled by the computer, traveled back-and-forth over the net. *Checker Games* had to be played with transparent overlays. In *Target Shooting*, players used a rifle-shaped light gun to shoot a static or moving square on the screen, with the hit registered by an optical sensor in the gun.⁴⁵

The Brown Box was demonstrated in 1969 to major TV manufacturers, resulting in a 1971 licensing agreement between Sanders and Californian electronics company Magnavox.⁴⁶ Baer and his colleagues helped the Magnavox engineers to work on the device and games. The end product was named the Odyssey Home Entertainment System and was manufactured and released by Magnavox in May 1972, making it the world's first home video game console.⁴⁷

Magnavox released a total of twenty-eight games for Odyssey, in genres including educational, math, board, card, shooting, and sports games. Sports games took up more than half of the list, covering nearly all the major disciplines—auto racing, basketball, baseball, American football, handball, ice hockey, skiing, soccer, table tennis, tennis, and volleyball—each pitting players against each other (see Figure 4). For example, the basketball game was played with a basketball court overlay covering the TV screen. Each gamer controlled a light spot representing a player. The aim was to dribble the ball (a moving light spot) and maneuver it to light up the opponent's basket. When one player had the

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Play these 12 games . . . electronic dot "players" race, spin, block, even ski on TV screen

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Each player can control his "player" vertically and horizontally; an action button starts the puck . . . "English" control adds twist to "fake out" your opponent.

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Includes a Master Control, two Player Controls, antenna-game switch, six preset circuit Game Cards, eleven Game Overlays and batteries.

The fast-paced action of hockey, the excitement of tennis and the strategy of football can all be duplicated in your own living room with the Odyssey™ by Magnavox. Attaches easily to any 18 to 25-inch (diagonal) black and white or color television set for extra electronic play enjoyment.

To set the game up, attach the antenna-game switch to the antenna terminals of your TV set. Connect the two Player Controls to the Master Control and then plug the Master Control into the antenna-game switch with the included cord provided. To play electronic table tennis, turn on your TV to 15-foot cord provided. To play electronic table tennis, turn on your TV to 15-foot cord provided. To play electronic table tennis, turn on your TV to 15-foot cord provided. To play electronic table tennis, turn on your TV to 15-foot cord provided.

Face off and aim for the goal . . . shoot the puck past the defender and score

Opposition tries to pass, check, defend

Face off and aim for the goal . . . shoot the puck past the defender and score

© 1973 Philips—Shipping weight 13 pounds \$99.95

Figure 4 — Magnavox Odyssey flyer. Source: Courtesy of Video Game History Foundation.

ball, the other could steal it or block a shot. Baer believed that *Ping-Pong* was the most interesting game and the console's biggest selling point. He recalled in 2010: "I was appalled when I saw the box and out comes 10,000 playing cards, paper money, and all this crap. I just knew, nobody's ever going to use this stuff. Everybody will put *Ping-Pong* on and that's it."⁴⁸

The Odyssey was a great commercial success. It was sold by Magnavox dealers across the United States and later released in Europe, Japan, and other regions in 1973 and 1974.⁴⁹ Its successor, the Odyssey 100, was released in 1975. It could only run two built-in sports games—*Tennis* and *Hockey*—and was able to output sound effects through a built-in speaker. Each player used three knobs fixed to the console to control paddle movement and ball trajectory. While there was still no on-screen scoring, players could mark their score using plastic cursors on the console. In the following two years, Magnavox released another seven updates of Odyssey, adding on-screen scoring, adjustable difficulty levels, four-player mode, new graphic effects, and other features.⁵⁰

Together with the rise of Baer's revolutionary TV game system, American electrical engineers Nolan Bushnell and Ted Dabney designed the world's first commercial arcade video game, *Computer Space*, in 1971,⁵¹ inspired by popular mainframe game *Spacewar!*. The game opened a new era for the coin-operated amusements industry, traditionally dominated by electromechanical pinball and slot machines. Bushnell and Dabney then founded their own video game company,

Atari, in California in June 1972. Inspired by Baer's *Ping-Pong* game, Bushnell appointed Atari's first full-time engineer, Al Alcorn, to develop a coin-operated video arcade game called *Pong*. The game was visually similar to *Ping-Pong* but surpassed it in many ways, with an on-screen scoreboard, simple sound effects, and variations that changed the angle and speed of the ball, making gameplay more challenging.

Pong was unveiled at an annual trade gathering in Chicago in June 1972 and officially released in November 1972 with a price tag of \$1,200. It was purchased by bars and entertainment centers and soon became a crowd favorite. More than 8,000 units were sold in the first two years after its release.⁵² Atari then launched *Pong Doubles* in 1973, which allowed four players to compete simultaneously, as in tennis doubles (see Figure 5). The following year, the company released more *Pong* variants, including *Quadrapong*, *Superpong*, *Rebound*, and *World Cup Football*.⁵³ The latter simulated a soccer match between two teams, each with two forwards, two defenders, and a goalkeeper, controlled by two knobs. The goalkeeper and forwards could stop the ball and shoot at different angles. The game could be played by one, two, or four players, with a time limit for each match, as in real soccer. It was a major evolution from *Pong*.

With the help of these games, Atari established itself as a leader in the rising video game industry, and a game development pioneer.⁵⁴ Starting in 1972, major American pinball and amusement machine manufacturers began to produce *Pong* clones, including Nutting Associates' *Computer Space Ball* (1972) and *Wimbledon* (1973); For-Play's *Sports Center* (1973); Amutronics' *TV Hockey* (1973)



Figure 5 — *Pong Doubles* flyer. Source: Courtesy of the Arcade Flyer Archive.

and *TV Ping Pong* (1973); Midway's *Winner* (1973) and *TV Basketball* (1974); and Ramtek's *Volly* (1973) and *Soccer* (1973). Although the graphics and mechanics of these games were almost identical to *Pong*, the manufacturers did introduce some new features to associate them with real-world sport. *Wimbledon*, for example, was one of the first video games to be named after a real sporting event—the famous Wimbledon Tennis Championships, held annually in London. It was also among the first color video games, using a TV monitor to display different colored paddles on a green grass tennis court background with white net and boundary lines, a step forward in recreating a realistic-looking sports field.

Meanwhile in Japan, newly rising coin-operated amusement machine companies headed by Namco, Sega, and Taito started to import *Pong* units from the United States, and later decided to make their own video arcade machines.⁵⁵ In July 1973, Taito released the first Japanese commercial arcade video game, *Elepong*.⁵⁶ In the following months, the company launched two more sports-themed *Pong* variants, *Pro Hockey* (1973) and *Davis Cup* (1973). The same year, Sega released its own *Pong* variants—*Pong-Tron*, *Pong Tron II*, and *Hockey TV*. Japanese developers brought ground-breaking innovations to sports game design. For instance, Taito's *Basketball* (1974) was one of the first video games to feature images of human characters and baskets (goals). Each player used a knob on the control panel to move a defender and an offensive player up or down to direct a bouncing ball into the basket to score. It was licensed by Midway and became one of the first Japanese video games to be imported into the United States.⁵⁷

The Evolution of Arcade Sports Games

The second half of the 1970s saw the arrival of microprocessor-based video arcade systems which offered more processing power and allowed game developers to implement new designs and features. An increasing number of these were released in the United States and Japan, bringing major changes to gameplay and audiovisual presentation. Sports games underwent a major evolution. Simple *Pong* variants began to be replaced by more sophisticated games that adopted the rules and actions of their sports, with Ramtek's *Deluxe Baseball* (1974) and Sega's *World Cup* (1977) the two pioneer titles. The former represented nine players in top-down perspective, shown on the playing field as white sprite images. Pitches could be fast, slow, or curveballs, there were strikeouts and walks, and outfielders could be repositioned (see Figure 6). These innovative designs required more processing power. According to the game's designer Alexander Smith, "The additional complexity of the game over ball-and-paddle concepts required two circuit boards instead of one, which led to problems during the manufacturing run."⁵⁸

World Cup featured a match between two six-player teams. Two players each used a trackball to control their players, and a knob to shift the ball around a player's foot and for passing and shooting. If the player with the ball was touched by an opponent, he lost possession. The unique control system and game mechanics made gameplay faster and more diverse than previous soccer games. It also featured sound effects such as kick-off whistle and spectator noise, adding realism to gameplay.⁵⁹ However, like Atari's *World Cup Football*, it was still

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BASEBALL
A New, truly Realistic
Baseball Game..
in a low profile cabinet.

CURVES
HOMERUNS
STRIKEOUTS
DOUBLE PLAYS
FASTBALLS
BIG STADIUM
WALKS
ERRORS
BASE HITS
33" FIELD

AVAILABLE FROM

another profit-maker from
RAMTEK CORPORATION

CHECK THESE EXCITING AND PROFITABLE FEATURES:

- Can be played by 1 or 2 players.
- Fast playing field with attractive stadium.
- Infield and outfield action, double plays.
- Strikeouts and walks possible.
- Outfielders can be repositioned.
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- Pitches can be fast or slow or curved.
- Low, attractive cabinet.
- All solid state for low maintenance and long life.
- Commercial 23" TV monitor insures reliability.
- One year logic board warranty.

UNEQUALED SERVICE

Ramtek video games are backed by the most responsive service in the industry. When repairs are needed, they're done fast. And new logic boards can be in the air within 24 hours. When it comes to service, Ramtek doesn't play games.

Approximate weight 210 lbs.
28 1/2" front x 34" deep x 52" high.

Operator selectable features:
Length of play:
25s or 50s

Figure 6 — *Deluxe Baseball* flyer. Source: Courtesy of the Arcade Flyer Archive.

based on ball-and-paddle dynamics. Rather than simulating a real soccer match, it was more like table football—a traditional table-top game loosely based on the sport.

Inspired by these games, Atari produced the Atari Sports series—*Atari Football* (1978), *Atari Baseball* (1979), *Atari Soccer* (1979), and *Atari Basketball* (1979)—all using a trackball-based control system adopted from Sega's *World Cup*.⁶⁰ This was the first sports game franchise in video game history. *Atari Baseball* was very similar to *Deluxe Baseball* in terms of graphics. Real baseball rules were applied, except that infielders were controlled by the computer and there was no base stealing. Players could use a number of real-life strategies, such as switch-hitting, full swings, bunting, or fooling the batter with a variety of pitches. Atari confidently advertised it as “a new breed” and “the most realistic video baseball attraction ever created.”⁶¹

Atari Football is considered one of the first proper interpretations of American football in video game form. It was also the first sports game to feature a two-way side-scrolling pitch, in contrast to the static playing field used previously. It simulated a game between two seven-player teams, displayed as Os and Xs. The team on offense selected one of four different preprogrammed run or pass plays, while the team on defense chose one of four defensive plays. The aim was to anticipate the opponent's play selection in order to outmaneuver them. Each player controlled the speed and running direction of one team member, with the rest of the team controlled by the computer.

Atari Football was released at a time when televised American football, notably *Monday Night Football* on ABC, had boosted the popularity of the sport.⁶² This helped it become immensely successful, selling over 15,000 units in the

United States alone.⁶³ Due to its overwhelming popularity, the game was licensed by Namco and released in Japan in 1979. The same year, Atari released an upgraded version, *Atari 4-Player Football*, which allowed two players to cooperate and compete against a rival team. The team on offense controlled the quarterback and a wide receiver, while the team on defense controlled both defensive backs. Along with *Space Invaders*, *Atari Football* was later credited as a central cause of the growth of the video arcade industry in the late 1970s.⁶⁴

The other two games in the Atari Sports series—*Atari Soccer* and *Atari Basketball*—were among the first to display actual play action. The former displayed a side-scrolling playing field in top-down perspective.⁶⁵ The latter used an angled side view allowing players to move in any direction on the court, as opposed to Taito's *Basketball* (1974), which limited movement to vertical (jump) only. Players could shoot, jump, steal the ball, or block a shot. Shooting was push-button controlled—the player needed to hold the control button longer for a longer shot, requiring more play skill than previous titles (see Figure 7).

In addition to contact team sports, recreational sports and fighting games were adapted into video arcade games; examples include Sega's *Heavyweight Champ* (1976); Atari's *Boxer* (1977), *Pool Shark* (1977), *Mini Golf* (1978), and parachuting game *Sky Diver* (1978); Exidy bowling game *Robot Bowl* (1977); and Midway's *Shuffleboard* (1978). *Heavyweight Champ*, for example, featured two boxing glove-shaped joysticks moved up, down, in, and out to control punching and defense—the first body movement-based sports video game in history, and one of the first sports games to feature real-time character animation. It was advertised by Sega as “a sports simulator videogame that offers the utmost in boxing realism.”⁶⁶ Despite the basic 2D black-and-white graphics, the game was ahead of its time and was groundbreaking for combining computer technology and video games with physical activity. Similar sports simulators and gaming accessories that

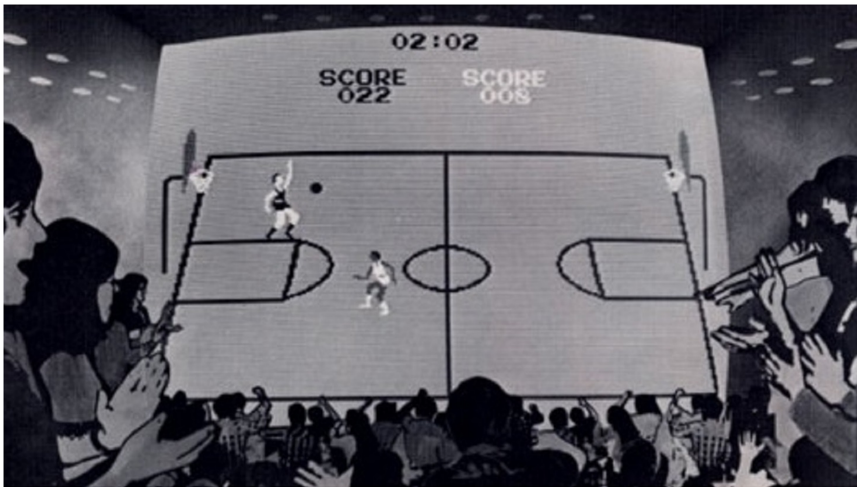


Figure 7 — *Atari Basketball* flyer. Source: Courtesy of the Arcade Flyer Archive.

physically involved players in a virtual environment only started to emerge a decade later.

Moving into the 1980s, iconic arcade games of various genres, such as Namco's maze action game *Pac-Man* (1980), Williams Electronics' scrolling shooter *Defender* (1981), and Nintendo's platform game *Donkey Kong* (1981), helped video games enter pop culture and gain mainstream acceptance. Though less popular than action, puzzle, and shooter games, sports games managed to gain a foothold in the coin-op amusement machine industry, and continued to grow in diversity and sophistication. More and more golf, billiards, and bowling games were produced, and water and winter games were added to the line-up.⁶⁷ Japanese game companies began to dominate the scene, ushering baseball, soccer, and American football games into the post-Atari era.

One defining feature of this new generation of games was that they began to mimic real-world sporting events, using various approaches to add realism to gameplay. The objective was to attract fans of specific professional sports leagues. Sega's blockbuster *Champion Baseball* (1983), for example, used a split screen to display the field and a close-up view of the batter and pitcher, as in TV broadcasts. Players chose to represent one of twelve American cities/states, matching real Major League Baseball (MLB) teams. Batters and pitchers on each team had the real players' batting averages and earned run averages. Sega even stated in a printed ad: "Championship Baseball is so real . . . the only thing missing are the hot dogs!"⁶⁸ The game achieved great success in the United States and Japan, where baseball is among the most popular spectator sports.⁶⁹

Furthermore, with advances in computer technology and the wide adoption of color CRT displays, game developers were now able to create more visually immersive virtual playing fields and diverse in-game characters of different gender and appearances. For example, Data East's *Pro Golf* (1981), Irem's *Tropical Angel* (1983), and Taito's *Joshi Volleyball* (1983) were the first to feature female protagonists.

Bringing the Playing Fields Home

From the mid-1970s, video games started to expand into the home entertainment market. In 1975, Atari began competing with Magnavox Odyssey by releasing its first home video game console through Sears, a major American department store chain. This \$100 dedicated console allowed two players to play a home version of *Pong* and was sold under Sears' Tele-Games brand.⁷⁰ A year later, Atari released a home version of *Pong* under its own brand, and by the end of 1977 a total of ten home *Pong* models had been produced.⁷¹ In the second half of the 1970s, more home video game consoles were produced by consumer electronics companies in the United States, Europe, and Japan, all using ball-and-paddle dynamics to simulate ball games such as soccer, volleyball, ping-pong, and tennis, due to both the prevalence of these sports across the globe and the simple rules and mechanisms which made it easy for developers to adapt them into games.

While *Pong* clones were starting to attract attention, home video game consoles began to adopt new technologies. In November 1976, American

semiconductor company Fairchild released Channel F, the first microprocessor-based video game console and the first to use an ROM cartridge. Powered by a Fairchild F8 CPU, it was also the first game console that allowed a player to compete against the computer.⁷² In the following two years, similar microprocessor-based home video game systems—known as second-generation consoles—emerged. Together with the widespread adoption of color TV sets in developed countries in the West, these home consoles brought color to video games and moved the virtual playing fields from amusement arcades to living rooms. Furthermore, the ROM cartridge systems and eight-bit microprocessors gave game developers enormous potential to implement new ideas and designs, which facilitated the evolution of sports video games.

First, unlike the first generation of dedicated consoles which only offered ball-and-paddle-based *Pong* variants, various sports were made available to home game players. Pioneers included *Bowling* (1977) on the RCA Studio II; Dodgeball game *Dodge It* (1978) on the Fairchild Channel F; skiing game *Winter Sports* (1978) and *Golf* (1978) on the Interton VC 4000; *Computer Golf!* (1978) on the Odyssey²; *NHL Hockey* (1979) on the Intellivision; and *Fishing Derby* (1980) on the Atari VCS.

Second, great efforts were made by game developers to improve the graphics and sound effects and make gameplay more realistic and engaging. For example, *Soccer* (1978) on the Interton VC 4000 displayed two eleven-player teams and implemented aspects such as offside, throw-ins, and corner kicks⁷³; *Football* (1978) on the Bally Astrocade used humanoid character animations and featured an in-game play-calling system allowing players to choose from a list of offensive plays⁷⁴; and *Tennis* (1981) on the Atari VCS displayed the court at an angled overhead view, as used in a real tennis broadcast. It was praised by reviewers as a major evolution from *Pong*-style ball-and-paddle sports games.⁷⁵

Third, sports-themed fighting games underwent a transformation. For instance, *Boxing Match* (1978) on the Interton VC 4000 had important improvements compared with Sega's *Heavyweight Champ*. It displayed a color boxing ring in side view, with each player controlling a boxer to move forward or backward and throw light/heavy blows at the opponent, or block punches.⁷⁶ *Sumo Wrestling* (1978) on the Visicom COM-100 was the first attempt to replicate traditional martial arts in video game form⁷⁷; *Boxing* (1980) on the Atari VCS showed the ring in top-down view and allowed the two avatar boxers to move in all directions and use both left and right punches.⁷⁸

The Home Sports Game War

The evolution of sports games can be partially attributed to the competition between video game companies, illustrated by the rivalry between Mattel and Atari. By the late 1970s, the Atari VCS had become the most popular second-generation console, selling over a million units in 1979 alone.⁷⁹ In the same year, American toy company Mattel released its first home video game console, Intellivision, equipped with a sixteen-bit General Instrument CP1610 microprocessor, 1,456 bytes of RAM, 7,168 bytes of ROM, a General Instrument AY-3-8914 sound chip, and a Standard Television Interface Chip from Texas

Instruments, offering superior processing power, graphics, and sound effects compared with Atari VCS and other second-generation consoles.

Intellivision's technical advances were clearly demonstrated by *NFL Football* (1979), released shortly after its launch. Licensed by the National Football League (NFL), the game pitted two players against each other in a 5v5 match, with over 160 offensive plays and ten defensive sets to choose from.⁸⁰ A massive improvement over Atari and other rival companies' arcade and home football video games, its two-way side-scrolling playing field, realistic character animation, and diverse formation and play options were praised by *Video* magazine as "without peer in the video-game field."⁸¹

In 1980, Mattel Electronics released a range of sports games—*Major League Baseball*, *NBA Basketball*, *NASL Soccer*, *NHL Hockey*, *PGA Golf*, *Tennis*, *U.S. Ski Team Skiing*, and *Auto Racing*—with *PBA Bowling* and *Boxing* added the following year. These games formed the Intellivision Sports Network, a main selling point of the Intellivision console. Assisted by these quality sports titles, Mattel Electronics sold more than 175,000 Intellivision consoles in its first year.

In order to catch up with Atari, the definite leader in the home video game market, the company launched a \$6 million advertising campaign in the United States in 1981, inviting award-winning American sports journalist George Plimpton to produce a series of TV commercials and print ads for the console. In these commercials, Plimpton compared the screenshots and short videos of Intellivision sports games with equivalent titles on the Atari VCS such as *Football* (1978), *Basketball* (1978), *Home Run* (1978), and *Golf* (1980), claiming that "two pictures are worth a thousand words" and that Intellivision games "looked and played more like the real thing"⁸² (see Figure 8).

The ad campaign was very successful, with 850,000 Intellivision units sold in 1981 and a million sold in 1982, generating a \$100 million profit for the company.⁸³ To compete with Intellivision Sports Network, Atari launched the RealSports series in 1982 for the VCS system (renamed Atari 2600 the same year) and the newly released Atari 5200 console.⁸⁴ The first three games in the series were *Baseball*, *Football*, and *Volleyball*, followed by *Soccer* and *Tennis* in 1983. They offered much improved graphics and more varied gameplay, and the Atari 5200's advanced hardware brought visual and sound effects to a new level.

Atari invited MLB player and manager Billy Martin and NFL player Ed "Too Tall" Jones to film commercials for the RealSports series. The two stars highlighted the realistic features of the Atari games and hinted that their Intellivision counterparts were inferior. Following *Pelé's Soccer* (1981) for the Atari 2600, which used the legendary Brazilian soccer player's image on the box cover and cartridge artwork, these TV commercials were among the first video ads to feature famous sportspeople; this approach has since been adopted by various video game companies and game publishers, further reinforcing the link between video games and real-world sport.

Unexpectedly, the war between Atari and Mattel suddenly ended due to the video game crash of 1983, caused by an oversupply of low-quality home console games.⁸⁵ This led to big losses for all major players in the industry, and the closure of many firms. The video arcade market was heavily affected as well, with both investors and consumers losing confidence.⁸⁶ In the end, the North American video



Figure 8 — Mattel Electronics Intellivision flyer comparing Atari’s *Home Run* (L) with Intellivision’s *Major League Baseball* (R).

game industry went from a \$3.2 billion business in 1983 to \$100 million in 1985.⁸⁷ The European market was also heavily affected and sales fell significantly.⁸⁸

The crash put an end to the Golden Age and halted the development of sports games. Atari split into Atari Corporation (consumer products) and Atari Games (arcade), and the RealSports series was suspended. Not until 1987 were another two RealSports titles—*Boxing* and *Title Match Pro Wrestling*—released on the Atari 2600. Mattel Electronics, runner-up in the home video game sector, lost over \$300 million in 1983 and was sold to INTV Corporation in 1984. INTV brought on former Intellivision programmers to update some old Sports Network games, but failed to return the franchise to its former glory.⁸⁹

Personal Computers Get Games

While video games were transforming the coin-operated amusement machine industry and expanding into the home entertainment sector, microprocessor-based fourth generation computers began to rise to prominence. Computers had become much smaller and cheaper to build, leading to personal computers such as the KIM-1 single-board computer, released by MOS Technology in 1976; the Apple II, Commodore PET, and Tandy Corporation TRS-80, released in 1977; and the Atari 400/800, released in 1979.⁹⁰ Naturally, home computer games became more

popular. Mainframe games were ported to them, and various pioneering games emerged.

The first generation of sports games for personal computers could be divided into text-based simulations and graphical games. The former was headed by American football simulations *End Zone* (1978) and *Gridiron: A Microfootball Game* (1979) for the TRS-80; *Quiz Baseball* (1978) and darts game *Bullseye* (1978) for the Apple II; and *Golf* (1978) and *Pro Football* (1978) for the Commodore PET. The latter included *Baseball* (1978), *Ten Pin Bowling* (1979), and *Basketball* (1980) for the TRS-80; *Apple II Baseball* (1978), *Apple Bowl* (1979), and *Pro Golf 1* (1979) for the Apple II; and Hayden Book Company's *Batter Up!!: A Microbaseball Game* (1979), Instant Software's *Golf* (1978) and *Bowling* (1978), and *Pong* clones for multiple systems. Some of these games were stored on floppy disks and cassette tapes, sold by mail order. Others were simply several pages of code published in computer magazines for players to input into their computers themselves.

In general, sports games were not as popular as action, adventure, puzzle, and strategy games on home computer platforms. They were also less attractive than their video arcade and console counterparts in terms of graphics, sound effects, and gameplay. On top of that, due to the comparatively high price of home computers, they were not very accessible to the general public and, therefore had only limited influence among the gaming community.

Nevertheless, some sports titles should be remembered for their pioneering role in the development of the genre. For instance, *Apple Bowl* featured 3D graphics. *Dart Room* (1979) and clay pigeon shooting game *Skeet Shoot* (1980) for the Apple II; mountain climbing game *Everest* (1979) and jousting game *Joust* (1980) for the Commodore PET; and *Olympic Decathlon* (1980) for the TRS-80 were among the first to adapt specific sports into video games.

Olympic Decathlon was arguably the most influential. Developed by Timothy W. Smith and published by Microsoft, it simulated real-life track and field events including the 100-, 400-, and 1,500-m sprints, 100-m hurdles, long jump, high jump, pole vault, shot put, discus, and javelin. Up to eight players could compete against each other, using the keyboard to control speed and movement. The skill, timing, and reflexes necessary for success were based on manual dexterity and hand-eye coordination.⁹¹ For example, in the javelin, players hit the (J) and (^) keys in turn as fast as possible to run and build up speed, hit the (C) key to tilt the javelin into throwing position, and hit the Enter key to throw before reaching the foul line. In the 1,500 m, players needed to keep the runner in the center of the track and avoid hitting the inner and outer track borders. Points were awarded based on finishing times, distances, or heights. The objective was to get the most points possible, and ultimately to beat American athlete Bruce Jenner's world record 8,168 points from the 1976 Montreal Olympics. Once a player surpassed Jenner's score, the new "world record" could be saved on the game floppy disk/cassette tape, and would be displayed the next time the game was played.

The game not only simulated the rules and actions of Olympic track and field events, but also allowed players to experience sports competition in a unique way, as gaming journalist Russell Sipe described in 1982: "I never thought that I'd see the day when I would get muscle strain from 'entering data.' After many events, you are likely to find your heart pounding almost as rapidly as it would were you

competing ‘live.’”⁹² The innovative design and engaging gameplay helped *Olympic Decathlon* win the Creative Computer Game of the Year award at America’s 1980 West Coast Computer Faire.⁹³ Due to its popularity, the game was ported to Apple II in 1981 and the new IBM PC in 1982, with minor graphic improvements.⁹⁴

Football Manager (1982) was another home computer game of great importance in the history of sports video games. Written in BASIC by British programmer Kevin Toms on Video Genie, a TRS-80 clone, this board game-based, text-only game let the player manage an English soccer team, using real FA (Football Association) club and player names. Each game character had a skill rating of one to five, an energy rating of one to twenty, and a monetary value in sterling, all of which would change as the season went on. Players made managerial decisions including buying and selling players; taking out bank loans; balancing finances; resting injured players; and selecting defenders, midfielders, and forwards, to balance the team’s overall performance based on the opposing team’s skill, energy, and morale ratings. The computer then played (calculated) the match based on these variables, with notifications when a goal was scored. After the match ended, the player could check the results of other league games and view each team’s position. The goal was to bring the team from the fourth to the first division, and also to win the FA Cup.

Like many other early computer games, *Football Manager* was produced and distributed independently by a one-person team, and the motivation was primarily based on the developer’s personal interest in the sport. Toms recalled: “I did it part-time while I worked as a programmer for the Open University. I love football. I can watch hours of football, just relaxing and looking at the strategy. I’ve always been like that. I always found it fascinating and that’s why I tried to make it work as a board game, getting the player to win games and climb up the league When I got hold of a computer I thought, well this could do that”⁹⁵

In 1982, Toms founded a company called Addictive Games to publish the game, placing ads in computer magazines to sell it by mail order. To increase sales, he ported the game to the newly released ZX81 (1981) and ZX Spectrum (1982) produced by British consumer electronics company Sinclair Research.⁹⁶ The ZX Spectrum version, which featured animated graphics showing the highlights of automated matches, was an instant hit in the United Kingdom, selling 30,000 copies through mail order within three months of release.⁹⁷ The game was then made available on various eight-bit home computer systems such as BBC Micro, Oric-1, Oric Atmos, Amstrad CPC, and Commodore 64, selling over 500,000 copies by 1988.⁹⁸ It led to popular spin-off soccer games and gave birth to a large sports management game community.

Summary Remarks and Suggestions for Future Research

Video/electronic games were born in the mid-twentieth century with the rise of electronic and digital computers. They were developed by American and British scientists on paper or in laboratories for academic purposes. Most of the pioneering games were created to simulate board games and sports competitions; some pitted

players against each other or against the computer, while others had the computer simulate matches based on statistical data. Many of the creators of these games were board game enthusiasts and sports fans—arguably the reason most early computer games were based on chess, billiards, tennis, baseball, and American football.

Together with the rise of microcomputers and the widespread adoption of TV sets in North America and Western Europe, commercial video games began to emerge in the early 1970s. Like their laboratory predecessors, most first-generation commercial games were sports-themed and primarily designed as platforms for competition between players. In the second half of the 1970s, ball-and-paddle-based games began to be replaced by more sophisticated games adopting the rules and actions of real-life sports. Home video game consoles brought the virtual playing field from arcade to living room.

By the late 1970s and early 1980s, intense competition between game producers and publishers had given birth to many innovative titles, with various sports disciplines adapted into games. At the same time, sports games began to appear on the newly emerging personal computers, creating new directions for the future development of the genre. Most of the sports games created in this period were based on competitive sports including American football, basketball, baseball, soccer, tennis, and ice hockey, as well as recreational sports like bowling, pool, and darts, many of them long popular in Western Europe and North America, some with a huge fan base in Japan. They were clearly produced to cater to the needs of gamers and sports fans in the world's three major TV, personal computer, video game, and sports markets at the time.

To conclude, the history of sports video games is still a novel topic in the research areas of both games studies and sports studies. This article attempts to provide an overview of the origins and development of sports video games from the 1950s to the early 1980s. Limited by its scope and objective, this research does not offer in-depth analysis and discussion of these games from social and cultural perspectives. It is hoped that this introductory work will benefit and inspire students and researchers who wish to conduct research on the relationships between sports, video games, popular culture, and technology in both the historical and modern contexts. Future research could use this article as an information source and reference while employing various social, psychological, and cultural theories to study the social impact of video games in general and sports games in particular. For example, more attention could be paid to the two-way interaction between video games and real-world sport, especially the positive and negative influence of video games on sports awareness and participation.

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