

2 A history of digital games ● ● ●

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Introduction ●

The history of digital games is filled with experimentation and innovation. As each new electronic device, such as the valve, silicon circuit, television, radio and so forth was invented, so the inclination of many researchers and users was to seek out whatever entertainment value could be had from the new technology. Thankfully, many older video games are playable today either through purchase on online auction houses or retro gaming companies, on updated versions on contemporary machines or through emulation software or websites. Video games have been available for (depending on where you take the starting point) between 35 and 50 years and so a rich and often subjective history has accumulated.

This chapter weaves a course through some of the developments, key products and companies in this field. It explains some of the frequently used jargon of the video gaming industry, both contemporary and historical. It cannot feature every video game console (of which there have been hundreds) or video game (of which there have been hundreds of thousands) but it gives a flavour of how we moved from a dot on the screen, to games which share the style and technology of many Hollywood blockbusters.

● In the beginning there was a dot...

Commercial, and widely used, versions of digital games did not, as we shall see, emerge until the late 1960s. However, while digital games precipitated the creation of many digital game-related development and production companies, several of the major companies of today incorporated these new entertainment technologies into their existing main business. For example, Nintendo, a Japanese company with origins in the 19th century, produced playing cards for nearly 80 years before diversifying into electronic technologies. Similarly, in 1956, Tokyo Telecommunications Laboratory, a business increasingly occupied with transistor-based products, changed its name to Sony, though its involvement with games consoles would not begin until the last decade of the century.

The pinpointing of the 'first' computer game is a contested issue with claims drawing on definition as well as chronology. In 1952 Alexander (Sandy) Douglas, then a PhD student at Cambridge University, produced a version of noughts and crosses (Tic-Tac-Toe) which ran on the EDSAC, the world's first stored-program computer to operate a regular computing service (Bryce and Rutter, 2003).

Six years later in 1958, William Higinbotham, a physicist at the Brookhaven National Laboratory, invented a basic simulation of tennis that functioned on a laboratory oscilloscope. The game quickly became a main attraction to visitors to the laboratory and is often claimed in literature to be the first computer game (Brookhaven National Laboratory, n.d.). In 1962, the game *Spacewar* was written by a team of researchers at Massachusetts Institute of Technology led by Steve Russell. *Spacewar* ran on a PDP-1, a large research computer within the faculty. The aim of this two-player game was to shoot at your opponent's ship, while avoiding falling into the sun. The game was copied, or modified, throughout a number of US academic institutions over the next few years making it the first game to be available outside a single research institute.

However, a major shift for the evolution of digital games came in 1967 when a text-based adventure game called *ADVENT* (short for 'adventure') was developed to run on mainframe computers. The game was so called because the original DECsystem-10 operating system it ran under only supported filenames of six characters but became *Adventure* (and variously *Colossal Cave Adventure*, *Colossal Adventure* or *Classic Adventure*) with its release into the young personal computer market in the early 1980s.

It is increasingly hard to remember that home computing is still relatively new. In the 1950s and 1960s, computers were few and far between, tending to be the size of a small room or large car. Few businesses could afford to purchase one computer, and many were owned by affluent research or military institutions. Processing power and memory size was primitive compared to the capabilities of the mobile phone handsets of today. Data entry was laborious, being through punched cards or paper tapes. It often took several hours, and regular maintenance and repairs, for example when changing valve tubes, to run one program.

Throughout the 1960s, an increasing number of people created basic digital games but struggled to find commercial funding or outlets for these. For example, in 1967 Sanders Associates created a television-based hockey simulation game, but failed to obtain a commercial outlet or funding from either television manufacturers or channel/content providers. It would be five years before the game would become commercially available, eventually appearing on Ralph Baer's Magnavox Odyssey home games console.

In 1969, Rick Blomme wrote a version of *Spacewar* which ran over the PLATO (Programmed Logic for Automatic Teaching Operations) network, an early computer-based learning system which had been built at the University of Illinois. The game marked the advent of online gaming, an area of gaming history we will return to in more detail later.

The first rise of the consoles ●

The Magnavox Odyssey was the first commercial home video game system. Launched in 1972 it sold over 100,000 units within the year. The console came with controllers and translucent screen overlays. These overlays added context to whatever game was being played; for example, the overlay for the tennis game included the court and net markings. In 1972, Nolan Bushnell formed the company known as Atari. Atari are perhaps the most well-known company in video gaming history, certainly from the USA. One of their first creations was an arcade machine version of *Pong*, an extremely simplified tennis simulation. Over the next few years, dozens of companies created clones of the game for use in either arcades or the home. *Pong* also marked the

start of the long relationship between the gaming and legal industries, as companies such as Atari and Magnavox disputed the origins and ownership of *Pong* and other games.

In 1977, Atari launched its Video Computer System (VCS), otherwise known as the 2600.¹ The console, with its sleek faux wood finish, proved immensely popular and arguably became the first games console to be bought in significant numbers. The console was marketed under a business model whereby most of the revenue was gained through sales of the associated games – a model still frequently employed in the digital games industry (see Alvisi, Chapter 4). The low price of the VCS encouraged sales of the console and consequently the software that it used.

BREAKOUT BOX 2.1 ●●●

Cartridge

Many of the early home-based video game consoles incorporated a slot. The console would plug into the television and into the slot would be put a cartridge (effectively a circuit board with the game hard coded into a chip), which contained the game. Game loading time was non-existent. However, as each game cartridge was effectively a piece of hardware, production costs were high. Over time, consoles gradually moved towards CD-like disc-based methods for selling games software as production costs were lower (though this made games vulnerable to disc-copying piracy). The Nintendo 64 machine of the mid to late 1990s was the last mainstream console to use cartridges.

The three years of 1978 to 1980 became, for historians of entertainment, a golden period of gaming development. During this time enduring popular games such as *Space Invaders*, *Zork*, *Pacman*, *Asteroids* and *Battlezone* were released. Versions of these games would appear on gaming consoles and other devices for the remainder of the century. By 1981 in the USA alone, US \$5 billion per year was being spent in games arcades and an additional billion dollars on home video gaming systems.

However, by the early 1980s, the games produced in-house by Atari were rapidly receding in terms of quality, customer appeal and, therefore, popularity. Many other companies struggled, merged or (increasingly)

went bankrupt. Atari was not alone. However, several poorly selling games left Atari with large amounts of unsold games, much of which (according to Internet legend) it buried in a pit in the New Mexico desert. The company continued to produce games and released a number of other consoles and home computers, though none matched the popularity of the early VCS days. Throughout the 1980s and 1990s, Atari was sold to a succession of parent companies and as with other games from that era, copies of its earlier titles command respectable prices on retro gaming web sites and online auction houses.

BREAKOUT BOX 2.2 ●●●

RAM: random access memory

Temporary memory in which programs and relevant data are stored. When the computer was switched off, the memory was wiped. RAM is measured in K or Kilobytes: 1K equals 1024 bytes (2^{10} bytes = 1024 bytes = 1KB), where each byte was the equivalent of one character or number. In the early 1980s, 32 K to 64 K of RAM was available in popular machines such as the Sinclair Spectrum, BBC Micro and Commodore 64. The Xbox and PlayStation 2 have 64 Mb (1 Mb = 1024^2 bytes) of RAM as standard and, at time of writing, it was rumoured that the Xbox 360 and PlayStation 3 will each use 512 Mb.

Home computing, PCs and PC gaming ●

The early 1980s saw a boom in ready-made home computers. In the UK, Sir Clive Sinclair launched a range of low-cost computers including the ZX80 (1980; in kit form), ZX81 (1981) and Spectrum. These computers were among the first to incorporate a keyboard, thus allowing the entry of programmes which could then be saved onto cassette tape. Though many of these were bought on the premise of being used for educational or work purposes, most primarily became home video game machines.

The Sinclair Spectrum, in particular, became a popular platform for games developers. Many of the leaders of UK and European game development houses today began their careers by writing games for these machines, often from home and working on their own.

Meanwhile, 1981 saw the launch by IBM of its 8088 processor-based PC. Though these were priced at a level to make them affordable to medium and large businesses only, increasingly, personal computers (PC) began to appear in the home and almost immediately became a platform for keen games developers.

Throughout the 1980s, various PC-clones (machines that could handle software developed for IBM PCs) were produced by hardware manufacturers as the market for these devices rapidly expanded. It was a computer game that was used as a calibration of compatibility: as *Spacewar* had been used as a diagnostic tool for PDP-1 machines so one of the new personal computers was not considered a hundred percent compatible with IBM machines unless it could run Microsoft's *Flight Simulator*.

Throughout the 1980s, the line between home computers and video games consoles became blurred; to this day, the phrases 'computer games' and 'video games' are often used interchangeably.

BREAKOUT BOX 2.3 ●●●

MUD: multi-user dungeon

A type of game, typically played online via a PC in the 1980s and 1990s. MUDs were quest-based games, primarily textual in appearance, that usually involved interacting with other characters in a pseudo-medieval Tolkienesque setting. The draw of MUDs involved making your character rise through the ranking system of the game, from a humble labourer to a grand wizard or necromancer, accumulating extra skills and powers on the way.

● The second rise of consoles in the home

In 1983, Nintendo released the Famicom (short for 'Family Computer') in Japan. The Famicom marked an early outing for Mario, a Nintendo character who would become synonymous with the company. Soon afterwards, Nintendo released the US version of the Famicom, known as the Nintendo Entertainment System (NES).

The mid-1980s are regarded by most digital games historians as a period which was dominated by Nintendo. This was partially because

the Famicom and NES were pitched with a retail tag of around US \$100, the console selling solidly in all territories where it was released. However, Nintendo was also a dominant market force due to the rapid contraction in Europe and the USA of the video game market (and consequently the supporting industry) in the mid-1980s. This was due, to an extent, to customer disillusionment in the quality of many games but also because of the rapid increase in sales of now-affordable PCs, which could play games and be used for more serious applications.

Against this backdrop of a struggling industry, another Japanese company, SEGA, was making some headway in the games console market. In 1985 it released the SEGA Master System, followed by the Genesis in 1989. SEGA also took on Nintendo in the emerging handheld console market, pitching its SEGA Game Gear (1990) against the Nintendo Game Boy (1988). Like Nintendo, SEGA introduced strong character branding through its games, the most well-known example being Sonic the Hedgehog. In 1991, Nintendo responded to the competition from SEGA with the Super NES (SNES) an enhanced version of the Famicom.

BREAKOUT BOX 2.4 ●●●

Bit

The 'bit' size of a console or gaming machine is often used as a rough benchmark by the public and the media for how powerful the machine is (replacing the 'RAM' benchmark of the 1980s). The more 'bits', the larger the numbers that the processor within the machine could handle and – at least in theory – the more complex games could be developed for the machine.

The year 1993 saw the launch of the first 64-bit console, the Jaguar, by Atari. The console proved too expensive for many gamers. With the limited range of software available compared to existing consoles, sales were disappointing, and Atari eventually withdrew from the hardware manufacturing side of the gaming industry.

Two years later, SEGA responded with the 32-bit Saturn. This console, like its successor the Dreamcast, contained facilities which enabled basic Internet access. Though the Saturn proved promising,

and played host to a clutch of classic games such as *NiGHTS*, the emergence of Sony's PlayStation in 1994 would limit the lifespan of SEGA's penultimate hardware platform.

The entry of Sony into the video game market is an interesting one. In the early 1990s, Sony and Nintendo negotiated to form an alliance and went into partnership on hardware development for the digital gaming sector (a move which, in retrospect, would have arguably led to a dominating or single-platform, market). However, the partnership broke down – games historians differ on why – and Sony decided to go it alone in producing a console.

Initially expensive, and released to a mixed reception from the public and industry, the PlayStation would gain momentum largely through the sheer number of games developed for it and aggressive marketing and pricing by Sony. High profile games and characters, most notably *Crash Bandicoot* and Lara Croft of *Tomb Raider* fame, helped the console to sell in large numbers to previously non-gaming players. The console was effectively remarketed as the PS One in the early part of the next decade, continuing to sell well to date despite the emergence of considerably more powerful consoles.

The closing years of the 1990s saw the global launch of a number of consoles. The two which attracted the lion's share of publicity and sales were the Nintendo 64, and the SEGA Dreamcast.

BREAKOUT BOX 2.5 ●●●

Tomb Raider and Lara Croft

If one game character is synonymous with 1990s video gaming, it would be Lara Croft. The first *Tomb Raider* game appeared on the Sony PlayStation in 1996, selling rapidly in large quantities. This featured Lara, a heavily-armed Indiana Jones type character with tight fitting clothes and large breasts. Despite suspicions, the developers deny that the character was designed for a core market of male teenage game players. Lara was the first game character to appear frequently across the general, non-gaming media, such as on magazine covers and in adverts. However, later updates of the *Tomb Raider* game have steadily diminished in popularity. While Lara Croft is often credited with making video games more 'mainstream', increasingly she is seen as a top-heavy throwback to a less intelligent and refined gaming concept.

Nintendo 64 ●

Nintendo launched the Nintendo 64 (otherwise known as the Ultra) in 1996. Though often thought of as a failure when sales figures are compared with the PlayStation, the Nintendo 64 did become the fifth best selling video game console in history. As games for the Nintendo 64 were still being released on cartridges, the take-up of the console was hindered by the software format: games which incurred production delays and high costs that were reflected in shop prices. However, a clutch of classic titles, including *Super Mario 64* (a 3D platform game), *GoldenEye* (a first person shooter) and *Zelda: Ocarina of Time* (a multi-genre game, still regarded by many as the best video game ever developed) helped the console achieve a significant user base.

SEGA Dreamcast ●

The SEGA Dreamcast had a spectacular though relatively short lifespan, being marketed from 1998 to 2002. Unusual marketing and advertising strategies (often referring to play in an abstract sense, but not to digital games) confused many game players. Despite a number of games that were graphically superior to comparable titles on rival platforms, many developers avoided or dropped development work for the console, leaving SEGA with an uphill struggle to see a return on its considerable investment. One critical failure of the console, which was marketed on the premise of offering online gaming, was the lack of such games in any quantity until near the end of its life when key titles such as *Phantasy Star Online* appeared. Despite the acclaim achieved by this title, which enabled easy and seamless online gameplay with and against people from around the world, the console was dropped in 2002 and SEGA moved solely into producing games software for other platforms.

The early years of the new millennium saw three key manufacturers each releasing one television-based video gaming console. The PlayStation 2 (PS2) is Sony's successor to its previous console. Sales of the console have grown to the extent that it has a probably unsurpassable lead over its contemporary competitors. A key feature of the console is the ability to play games developed for the original PlayStation. Added to this was the support of more developers than the other consoles and the continuation of several key game franchises, such as *Grand Theft Auto*, *FIFA* (football/soccer) and *Gran Turismo*.

The Xbox is the console developed and marketed by Microsoft. The Xbox is unusual for a games console in that it contains a hard drive. This allows soundtracks and game components to be saved and used in-game. Microsoft promoted the Xbox with the largest marketing and advertising campaign of any console launch. The launch proved successful in the USA, though sales in Europe have taken time to build momentum and the Japanese market is still insignificant. In this territory the unusually large size of the console was one of the reasons often given for its slow sales, as Japanese homes and culture are traditionally more accommodating to smaller, more compact devices.

A key factor which attracted early adopters of the Xbox at the launch was the game *Halo*, which received critical acclaim from nearly all quarters of the gaming industries and media. Microsoft has either brokered deals with, or acquired, a number of development and production companies, such as Rare, thus ensuring a steady stream of games for the console.

The GameCube was Nintendo's successor to the N64. Unlike the Xbox and the PS2, the GameCube did not have the facility to play CDs or DVDs, using a proprietary disc format instead. In the early period of its life, this limitation was used by business analysts to often negatively forecast its future against its rivals. However, the GameCube has made strong use of Nintendo game character brands and franchises, such as Mario and Zelda, and has subsequently enjoyed reasonable success in the console marketplace. The development of more games aimed at an adult market, such as titles in the *Resident Evil* series, has shown that the console is not exclusively aimed at a schoolchild audience.

However, by the end of 2004, speculation was rife about the next generation of consoles, and possible successors to each of these three predominant machines of the age.

● The ubiquitous game

● Games as accessories

Digital games appear periodically in a number of forms. In the 1970s and 1980s, digital games were produced in watch format, as LCD panels and as self-contained toys and games. Examination of the

catalogue of any major toy store or in-flight trolley sales brochure, often reveals a variety of such games. Some games, and gaming brands, have become phenomenally popular for short periods of time. In 1996, Bandai released Tamagotchi. This game, available on a key ring-sized device, involved 'growing' a digital animal and ensuring it was fed and generally looked after various times of the day and night. Despite the game appearing to be more work than play it sold at a rapid rate shipping around 20 million units in its first year.

The following year, Nintendo released Pokémon, a similar 'creature nurturing' game on its Game Boy and Nintendo 64 consoles. Nintendo used the Pokémon brand in a wide range of products, including movies, books, cartoons, food and toys. As of the end of 2001, Nintendo had released over a thousand Pokémon tie-in licences with total sales of some US \$20 billion. The potent combination of collecting items, and defeating opponents with your collection, ensured sales that have only recently begun to abate.

Handheld consoles: gaming goes mobile ●

In the early 1990s, Nintendo launched the Game Boy. This offered a two-colour display and a small but rapidly growing selection of cartridge-based games, the most well-known being *Tetris*, which helped to cement the popularity of the console. Later on in the decade, the Pokémon series of games (based around the concepts of digital trading cards and monster fighting) greatly increased sales. The original console was followed by a version offering games in colour, then a version (Game Boy Advance) enabling considerably more complex and detailed games to be developed and sold.

Throughout the life of the Game Boy other handheld consoles were launched by rival companies. Consoles such as the Neo Geo were arguably superior in terms of processor power, game depth, detail and colour. However, the extensive collection of titles available for the Game Boy has ensured that no competing handheld console has so far provided a serious challenge. The Game Boy Advance, while having a battery life of over 20 hours, drew complaints over it not containing back lighting to make the screen easier to see, which often made games difficult to play. In 2003 Nintendo launched the Game Boy SP, a version containing a backlight and sales proved impressive with a number of countries experiencing initial stock shortages.

The end of 2004 and the start of 2005 saw a new rivalry in the handheld console market, with products by both Nintendo and Sony. Nintendo launched the DS, which featured two screens (one of which was touch sensitive). The console made use of both wireless technologies – allowing a classroom of children to play the same game – and online technology for more remote and larger user base games. Sony launched the PSP, a console relying on the strong branding of many PlayStation game franchises.

● Converging the game

Early mobile phones often included simple monochrome games such as *Snake*, which were similar in nature, complexity and visual style to games on early home computers such as the ZX80 and ZX81. As mobile phones have rapidly increased in functionality and technical power so the games they support have become more complex. However, three restrictions have impeded the emergence of games which can rival those found on handheld and television-based consoles:

- the processing power within the mobile phone;
- the speed of download of games and upgrades, though faster 3G networks promise to eradicate this problem; and
- the small screen size

In 2003 Nokia released the N-Gage, a handheld gaming device with mobile phone facilities. Reviews of test and early games were mixed (see, for example ZDNet Australia, 2003), though the appearance of key gaming franchises such as *Tomb Raider* and *Sonic* show that some of the larger gaming industry developers are investing in developing for such a platform. An upgrade of the N-Gage has helped sales, but at the same time several other similar devices have entered the market, thus making it unclear as to any long-term dominating device. The advent of mobile games offers great possibilities, especially as the mobile phone is becoming a significant platform for gaming and the majority of children possess such a device. Here, there is already intense social collaboration around this device, through the use of SMS (short message service), between school children. Bluetooth enables synchronous mobile phone play between some handsets over short distances and emerging mobile technologies will make more widespread and develop the range of digital gaming.

BREAKOUT BOX 2.6 ●●●

MMORPG: massive multiplayer online role-playing game

This clumsy acronym adequately describes this particular type of game. Primarily through personal computers (though some console-based MMORPGs are starting to become available), thousands of people 'log on' to a virtual world. Here, they control an avatar (a configurable person) within a graphical landscape. The avatar can trade, communicate, fight and interact in other ways with avatars controlled by other players. A MMORPG can be thought of as the modern version of the MUD.

Online games ●

As we have seen, through games such as MUD-type games, online gaming is not a new concept. Typically, online gaming has been regarded until recently as a niche form of gameplay on personal computers, as consoles did not offer online capabilities.

However, starting with the SEGA Dreamcast, all popular video game consoles now offer such an option, though the proportion of games that use it is still not high. Online gaming is fiscally attractive to game and console developers: the financial return for committed players is far higher than for single discrete offline games as monthly subscriptions generate ongoing income. Partly because of this, for the last few years, online games have been widely predicted as the future of mainstream, or mass public, digital game playing.

Perhaps the best-known online game is *EverQuest*, a massive multiplayer online role-playing game often played simultaneously (and for long periods of time) by several hundred thousand people. The game has become a contemporary cultural reference point. It has also generated a (real world) economy comparable to that of a medium-sized country (Lichtarowicz, 2002). Such games are often characterized by the dedication and commitment exhibited by the players. For example, about one third of the adult players of *EverQuest* spent more time in a typical week in the virtual world than in paid employment (Castronova, 2001).

While MMORPGs (massive multiplayer online role-playing game) dominate online gaming, other types of games that use this remote media are emerging. Anecdotal information points to online card games, typically played by middle aged and elderly American

citizens, as being a large market (though precise figures are more difficult to come by). Increasingly, games are being developed for both PCs and for video consoles where the multiplayer aspect is the primary driver of the game (whereas the traditional approach was for the single player to be the key feature, with a few static online features as an added bonus).

However, the largest factor in the rapid emergence of online gaming for the general public is the take-up of domestic broadband access in recent years, making it possible to play complex games against large numbers of opponents with little or no delay or 'lag'. It is with this emerging method of game-playing that the next chapter of the history of this form of entertainment will be written.

Relevant web sites ●●●

Atari History Museum <http://www.atari-history.com>
Brief History of Video Games <http://www.geekcomix.com/vgh>
Digiplay Initiative, Computer Gaming Timeline <http://www.digiplay.org.uk/timeline.php>
Dot Eaters, Classic Video Game History <http://www.emuunlim.com/doteaters>
Edsac Simulator <http://www.dcs.warwick.ac.uk/~edsac>
Emulators Unlimited <http://www.emuunlim.com>
Game Archive <http://www.gamearchive.com/vault>
Gamespot, History of Video Games <http://www.gamespot.com/gamespot/features/video/hov>
Nintendo Land <http://www.nintendoland.com>
PONG-Story <http://www.pong-story.com>
Ralph H. Baer <http://www.ralphbaer.com>
Spacewar! <http://lcs.www.media.mit.edu/groups/el/projects/spacewar>
Video Game Museum <http://www.vgmuseum.com>
Videogames.org <http://www.videogames.org>

● Note

¹ It is important to note that a significant number of video game consoles were released with different names in the three main 'territories' of the USA, Japan and Europe.

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