= NeXT =

NeXT , Inc . (later NeXT Computer , Inc. and NeXT Software , Inc) was an American computer company headquartered in Redwood City , California , that developed and manufactured a series of computer workstations intended for the higher education and business markets . NeXT was founded in 1985 by Apple Computer co @-@ founder Steve Jobs , after he resigned from Apple , along with his co @-@ workers . NeXT introduced the first NeXT Computer in 1988 , and the smaller NeXTstation in 1990 . The NeXT computers experienced relatively limited sales , with estimates of about 50 @,@ 000 units shipped in total . Nevertheless , their innovative object @-@ oriented NeXTSTEP operating system and development environment were highly influential .

The NeXT Computer and NeXTSTEP operating system were the platform used for creating the World Wide Web , as well as creating the first app store , which was originally demonstrated to Steve Jobs in 1993 .

NeXT later released much of the NeXTSTEP system as a programming environment standard called OpenStep . NeXT withdrew from the hardware business in 1993 to concentrate on marketing OPENSTEP for Mach , its own OpenStep implementation , for several OEMs . NeXT also developed WebObjects , one of the first enterprise Web application frameworks . WebObjects never became very popular because of its initial high price of $ 50 @,@ 000 , but it remains a prominent early example of a Web server based on dynamic page generation rather than on static content .

Apple purchased NeXT in 1997 for $ 429 million and 1 @.@ 5 million shares of Apple stock . As part of the agreement , Steve Jobs , Chairman and CEO of NeXT Software , returned to Apple , the company he had co @-@ founded in 1976 . The founder promised to merge software from NeXT with Apple 's hardware platforms , eventually resulting in OS X , iOS , and now watchOS and tvOS . Parts of these operating systems incorporated the OPENSTEP foundation .

= = History = =

= = = Background = = =

In 1985 , Apple co @-@ founder Steve Jobs was the head of Apple 's SuperMicro division , which was responsible for the development of the Macintosh and Lisa personal computers . The Macintosh had been successful on university campuses in considerable part because of the Apple University Consortium , which allowed students and institutions to buy the computers at a discount . The consortium had sold more than $ 50 million in computers by February 1984 .

While chairman , Jobs visited university departments and faculty members to sell Macintosh . Jobs met Paul Berg , a Nobel Laureate in chemistry , at a luncheon held in Silicon Valley to honor François Mitterrand , then President of France . Berg was frustrated by the expense of teaching students about recombinant DNA from textbooks instead of in wet laboratories , used for the testing and analysis of chemicals , drugs , and other materials or biological matter . Wet labs were prohibitively expensive for lower @-@ level courses and were too complex to be simulated on personal computers of the time . Berg suggested to Jobs to use his influence at Apple to create a " 3M computer " workstation for higher education , featuring more than one megabyte of random @-@ access memory (RAM) , a megapixel display and megaFLOP performance , hence the name " 3M " .

Jobs was intrigued by Berg 's concept of a workstation and contemplated starting a higher education computer company in the fall of 1985 , amidst increasing turmoil at Apple . Jobs ' division did not release upgraded versions of the Macintosh and most of the Macintosh Office . As a result , sales plummeted , and Apple was forced to write off millions of dollars in unsold inventory . Apple 's chief executive officer (CEO) John Sculley ousted Jobs from his day @-@ to @-@ day role at Apple , replacing him with Jean @-@ Louis Gassée in 1985 . Later that year , Jobs began a power struggle to regain control of the company . The board of directors sided with Sculley while Jobs took a business visit to Western Europe and the Soviet Union on behalf of Apple .

= = = Original NeXT team = = =

After several months of being sidelined , Jobs resigned from Apple on September 13 , 1985 . He told the board he was leaving to set up a new computer company , and that he would be taking several Apple employees from the SuperMicro division with him . He also told the board that his new company would not compete with Apple and might even consider licensing its designs back to them to market under the Macintosh brand .

Jobs named his new company Next , Inc . A number of former Apple employees followed him to Next , including Joanna Hoffman , Bud Tribble , George Crow , Rich Page , Susan Barnes , Susan Kare , and Dan 'l Lewin . After consulting with major educational buyers from around the country , including a follow @-@ up meeting with Paul Berg , a tentative specification for the workstation was drawn up . It was designed to be powerful enough to run wet lab simulations and cheap enough for college students to use in their dormitory rooms . Before the specifications were finished , however , Apple sued Next for " nefarious schemes " to take advantage of the cofounders ' insider information . Jobs remarked , " It is hard to think that a $ 2 billion company with 4 @,@ 300 @-@ plus people couldn 't compete with six people in blue jeans . " The suit was eventually dismissed before trial .

In 1986 , Jobs recruited the famous graphic designer Paul Rand to create a brand identity costing $ 100 @,@ 000 . Rand created a 100 @-@ page brochure detailing the brand , including the precise angle used for the logo (28 °) and a new company name , NeXT . The first major outside investment was from Ross Perot , who invested after seeing a segment about NeXT on The Entrepreneurs . In 1987 , he invested $ 20 million in exchange for 16 percent of NeXT 's stock and subsequently joined the board of directors in 1988 .

= = = 1987 ? 93 : NeXT Computer = = =

= = = = First generation = = = =

NeXT changed its business plan in mid @-@ 1986 . The company decided to develop both computer hardware and software , instead of just a low @-@ end workstation . A team led by Avie Tevanian , who had joined the company after working as one of the Mach kernel engineers at Carnegie Mellon University , was to develop the NeXTSTEP operating system . The hardware division , led by Rich Page ? one of the cofounders who had previously led the Apple Lisa team ? designed and developed the hardware . NeXT 's first factory was completed in Fremont , California in 1987 . It was capable of producing 150 @,@ 000 machines per year . NeXT 's first workstation was officially named the NeXT Computer , although it was widely termed " the cube " because of its distinctive case , a 1 ft magnesium cube , designed by Apple IIc case designer Frogdesign in accordance with an edit from Jobs .

The original design team had anticipated releasing the computer for US $ 3 @,@ 000 in spring of 1987 to be ready for sale by summer of that year . Prototype workstations were eventually shown to standing ovations on October 12 , 1988 . The NeXT Computer was revealed at a lavish , invitation @-@ only gala event , " NeXT Introduction ? the Introduction to the NeXT Generation of Computers for Education " at the Louise M. Davies Symphony Hall , San Francisco , California on Wednesday October 12 , 1988 . The following day , selected educators and software developers were invited (for $ 100 registration fee) to attend the first public technical overview of the NeXT computer at an event called " The NeXT Day " held at the San Francisco Hilton . This event gave developers interested in developing NeXT software an insight into the software architecture , object @-@ oriented programming and developing for the NeXT Computer . The luncheon speaker was Steve Jobs .

The first machines were tested in 1989 , after which NeXT started selling limited numbers to universities with a beta version of the NeXTSTEP operating system installed . Initially the NeXT Computer was targeted at U.S. higher education establishments only , with a base price of $ 6 @,@

500 . The machine was widely reviewed in magazines , generally concentrating on the hardware . When asked if he was upset that the computer 's debut was delayed by several months , Jobs responded , " Late ? This computer is five years ahead of its time ! "

The NeXT Computer was based on the new 25 MHz Motorola 68030 central processing unit (CPU) . The Motorola 88000 RISC chip was originally considered , but was not available in sufficient quantities . It included between 8 and 64 MB of random @-@ access memory (RAM) , a 256 MB magneto @-@ optical (MO) drive , a 40 MB (swap @-@ only) , 330 MB , or 660 MB hard disk drive , 10BASE2 Ethernet , NuBus and a 17 @-@ inch MegaPixel grayscale display measuring 1120 by 832 pixels . In 1989 a typical new PC , Macintosh , or Amiga computer included a few megabytes of RAM , a 640 × 480 16 @-@ color or 320x240 4000 @-@ color display , a 10 to 20 megabyte hard drive and few networking capabilities . It also was the first computer to ship with a general @-@ purpose DSP chip (Motorola 56001) on the motherboard . This was used to support sophisticated music and sound processing , including the Music Kit software .

The magneto @-@ optical drive manufactured by Canon Inc. was used as the primary mass storage device . These drives were relatively new to the market , and the NeXT was the first computer to use them . They were cheaper than hard drives (blank media especially so : though each had a cost of $ 150 to Canon , Jobs 's typically forthright negotiations saw Canon agree to a retail of only $ 50 apiece) but slower (with an average seek time of 96 ms) . The design made it impossible to move files between computers without a network , since each NeXT Computer had only one MO drive and the disk could not be removed without shutting down the system . Storage options proved challenging for the first NeXT Computers . The magneto @-@ optical media was relatively expensive and had performance and reliability problems despite being faster than a floppy drive . The drive was not sufficient to run as the primary medium running the NeXTSTEP operating system both in terms of speed and capacity .

In 1989 , NeXT struck a deal for former Compaq reseller Businessland to sell NeXT computers in select markets nationwide . Selling through a retailer was a major change from NeXT 's original business model of only selling directly to students and educational institutions . Businessland founder David Norman predicted that sales of the NeXT Computer would surpass sales of Compaq computers after 12 months .

In 1989 , Canon invested US $ 100 million in NeXT , giving it a 16 @.@ 67 percent stake , making NeXT worth almost $ 600 million . Canon invested in NeXT with the condition that it would be able to use the NeXTSTEP environment with its own workstations , which would mean a greatly expanded market for the software . After NeXT exited the hardware business , Canon produced a line of PCs , called object.station , including models 31 , 41 , 50 and 52 , specifically designed to run NeXTSTEP / Intel . Canon also served as NeXT 's distributor in Japan .

The first NeXT computers were released on the retail market in 1990 , for $ 9 @,@ 999 . NeXT 's original investor Ross Perot resigned from the board of directors in June 1991 to dedicate more time to Perot Systems , a Plano , Texas @-@ based systems integrator .

= = = = Second generation = = = =

NeXT released a second generation of workstations in 1990 . The new range included a revised NeXT Computer , renamed the NeXTcube , and the NeXTstation , nicknamed " the slab , " which used a " pizza box " case form @-@ factor . Jobs was explicit in ensuring NeXT staff did not use the latter terminology , lest the NeXT machines be compared to competing Sun workstations . The magneto @-@ optical drive was replaced with a 2 @.@ 88 MB floppy drive to offer users a way to use their floppy disks . However , individual 2 @.@ 88 MB floppies were expensive and the technology did not supplant the 1 @.@ 44 MB floppy . Realizing this , NeXT utilized the CD @-@ ROM drive , which eventually became an industry standard for storage . Color graphics were available on the NeXTstation Color and the NeXTdimension graphics processor hardware for the NeXTcube . The new computers were cheaper and faster than their predecessors , with the new Motorola 68040 processor .

In 1992 , NeXT launched " Turbo " variants of the NeXTcube and NeXTstation with a 33 MHz

68040 processor and maximum RAM capacity increased to 128 MB . NeXT sold 20 @,@ 000 computers in 1992 (NeXT counted upgraded motherboards on back order as sales) ? a small number compared with their competitors . However , the company reported sales of $ 140 million for the year , encouraging Canon to invest a further $ 30 million to keep the company afloat .

In total , 50 @,@ 000 NeXT machines were sold , including thousands to the then super secret National Reconnaissance Office located in Chantilly , Virginia . NeXT 's long @-@ term aim was to migrate to the RISC (Reduced Instruction Set Computing) architecture , a processor design strategy intended to increase performance . The project was known as the NeXT RISC Workstation (NRW) . Initially the NRW was to be based on the Motorola 88110 processor , but due to a lack of confidence in Motorola 's commitment to the 88000 @-@ series architecture , it was later redesigned around dual PowerPC 601s . NeXT produced some motherboards and enclosures , but exited the hardware business before full production .

= = = = Software applications = = = =

NeXT computers were delivered with Mathematica pre @-@ installed . Several developers used the NeXT platform to write pioneering programs . Tim Berners @-@ Lee used a NeXT Computer in 1990 to create the first Web browser and Web server ; accordingly , NeXT was instrumental in the development of the World Wide Web .

NeXT was an engineering computer used by professors for the most serious science challenges , and also for developing finished newspaper layouts using News running on Next . George Mason University in the early 1990s had a set of them for publishing , as well as Silicon Graphics for CAD / GL and Mathematica for astrophysics . The games Doom , Doom II : Hell on Earth and Quake were developed by id Software on NeXT machines . Other games based on the Doom engine , such as Heretic and Hexen : Beyond Heretic by Raven Software , as well as Strife by Rogue Entertainment were also developed on NeXT hardware using id 's tools .

Other commercial programs were released for NeXT computers , including Altsys Virtuoso , a vector drawing program with page @-@ layout features which was ported to Mac OS and Microsoft Windows as Aldus FreeHand v4 , and the Lotus Improv spreadsheet program . The systems also came with a number of smaller built @-@ in applications , such as the Merriam @-@ Webster Collegiate Dictionary , Oxford Quotations , the complete works of William Shakespeare , and the Digital Librarian search engine to access them .

= = = 1993 ? 96 : NeXT Software = = =

NeXT started porting the NeXTSTEP operating system to IBM PC compatible computers using the Intel 80486 processor in late 1991 . The operating system was ported to Intel 's architecture because of a change in NeXT 's business strategy , which was then to remove themselves from the hardware business entirely . A demonstration of the port was displayed at the NeXTWorld Expo in January 1992 . By mid @-@ 1993 the product was complete and version 3 @.@ 1 , also known as NeXTSTEP 486 , was released . Prior to the release of NeXTSTEP , Chrysler planned to buy 3 @,@ 000 copies in 1992 .

NeXTSTEP 3.x was later ported to PA @-@ RISC and SPARC @-@ based platforms , for a total of four versions : NeXTSTEP / NeXT (for NeXT 's 68k " black boxes ") , NeXTSTEP / Intel , NeXTSTEP / PA @-@ RISC and NeXTSTEP / SPARC . Although these ports were not widely used , NeXTSTEP gained popularity at institutions such as First Chicago NBD , Swiss Bank Corporation , O 'Connor and Company , and other organizations owing to its programming model . It was also used by many American federal agencies , such as United States Naval Research Laboratory , the National Security Agency , the Advanced Research Projects Agency , the Central Intelligence Agency and the National Reconnaissance Office . Some IBM PC clone vendors offered somewhat customized hardware solutions that were delivered running NeXTSTEP on Intel , such as the Elonex NextStation and the Canon object.station 41 .

NeXT withdrew from the hardware business in 1993 and the company was renamed NeXT

Software Inc ; consequently , 300 of the 540 staff employees were laid off . NeXT negotiated to sell the hardware business , including the Fremont factory , to Canon . Canon later pulled out of the deal . Work on the PowerPC machines was stopped , along with all hardware production . CEO of Sun Microsystems Scott McNealy announced plans to invest $ 10 million in 1993 and use NeXT software (OpenStep) in future Sun systems . NeXT partnered with Sun to create OpenStep which was NeXTSTEP sans the Mach @-@ based kernel .

After dropping the hardware business , NeXT returned to selling a toolkit to run on other operating systems , in effect returning to the original business plan . New products based on OpenStep were released , including OpenStep Enterprise , a version for Microsoft 's Windows NT . The company also launched WebObjects , a platform for building large @-@ scale dynamic web applications . Many large businesses including Dell , Disney , WorldCom , and the BBC used this WebObjects software for a short time . In the modern day , WebObjects is used almost solely to power Apple 's iTunes Store and most of its corporate Web site .

= = = 1996 ? 97 : Apple merger = = =

Apple Computer announced an intention to acquire NeXT on December 20 , 1996 . Apple paid $ 429 million in cash , which went to the initial investors and 1 @.@ 5 million Apple shares , which went to Steve Jobs , who was deliberately not given cash for his part in the deal . The main purpose of the acquisition was to use NeXTSTEP as a foundation to replace the dated Mac OS , instead of BeOS or the in @-@ development Copland . The deal was finalized on February 7 , 1997 , bringing Jobs back to Apple as a consultant , who was later appointed as interim CEO . In 2000 Jobs took the CEO position as a permanent assignment .

Several NeXT executives replaced their Apple counterparts when Steve Jobs restructured the company 's board of directors . Over the next five years the NeXTSTEP operating system was ported to the PowerPC architecture . At the same time , an Intel port and OpenStep Enterprise toolkit for Windows were both produced . The operating system was code named Rhapsody , while the toolkit for development on all platforms was called " Yellow Box " . For backwards compatibility Apple added the " Blue Box " to Rhapsody , allowing existing Mac applications to be run in a self @-@ contained cooperative multitasking environment .

A server version of the new operating system was released as Mac OS X Server 1 @.@ 0 in 1999 , and the first consumer version , Mac OS X 10 @.@ 0 , in 2001 . The OpenStep developer toolkit was renamed Cocoa . Rhapsody 's Blue Box was renamed Classic Environment and changed to run applications full @-@ screen without requiring a separate window . Apple included an updated version of the original Macintosh toolbox , called Carbon , that gave existing Mac applications access to the environment without the constraints of Blue Box . Some of NeXTSTEP 's interface features were used in Mac OS X , including the Dock , the Services menu , the Finder 's " browser " view , and the Cocoa text system .

NeXTSTEP 's processor @-@ independent capabilities were retained in Mac OS X , leading to both PowerPC and Intel x86 versions (although only PowerPC versions were publicly available before 2006) . Apple moved to Intel processors by August 2006 .

= = Corporate culture and community = =

Jobs created a different corporate culture at NeXT in terms of facilities , salaries , and benefits . Jobs had experimented with some structural changes at Apple but at NeXT he abandoned conventional corporate structures , instead making a " community " with " members " instead of employees . There were only two different salaries at NeXT until the early 1990s . Team members who joined before 1986 were paid $ 75 @,@ 000 while those who joined afterwards were paid $ 50 @,@ 000 . This caused a few awkward situations where managers were paid less than their employees . Employees were given performance reviews and raises every six months because of the spartan salary plans . To foster openness , all employees had full access to the payrolls , although few employees ever took advantage of the privilege . NeXT 's health insurance plan

offered benefits to not only married couples but unmarried couples and same @-@ sex couples , although the latter privilege was later withdrawn due to insurance complications . The payroll schedule was also very different from other companies in Silicon Valley at the time : instead of getting paid twice a month at the end of the pay period , employees would get paid once a month in advance .

Jobs found office space in Palo Alto , California on 3475 Deer Creek Road , occupying a glass and concrete building which featured a staircase designed by architect I. M. Pei . The first floor used hardwood flooring and large worktables where the workstations would be assembled . To avoid inventory errors , NeXT used the just @-@ in @-@ time (JIT) inventory strategy . The company contracted out for all major components such as mainboards and cases and had the finished components shipped to the first floor for assembly . The second floor was the office space with an open floor plan . The only enclosed rooms were Jobs 's office and a few conference rooms .

As NeXT expanded , more office space was needed . The company rented an office at 800 and 900 Chesapeake Drive in Redwood City , also designed by Pei . The architectural centerpiece was a " floating " staircase with no visible supports . The open floor plan was retained , although furnishings became luxurious , with $ 5 @,@ 000 chairs , $ 10 @,@ 000 sofas and Ansel Adams prints .

NeXT 's first former campus in Palo Alto was subsequently occupied by SAP AG . Its second former campus in Redwood City was occupied by ApniCure and OncoMed Pharmaceuticals Inc .

The first issue of NeXTWORLD magazine was printed in 1991 . It was published in San Francisco by Integrated Media and edited by Michael Miley and later Dan Ruby . It was the only mainstream periodical to discuss NeXT computers , the operating system , and NeXT software . Publication was discontinued in 1994 after only four volumes were released . A NeXTWORLD Expo followed as a developer conference , held in 1991 and 1992 at the San Francisco Civic Center and in 1993 and 1994 at the Moscone Center in San Francisco , with Steve Jobs as the keynote speaker .

= = Influence on the computer industry = =

Steve Jobs pooled the finest of over @-@ specified hardware and software into NeXT , and also the company added innovations of their own . As such , it was the machine of choice for well @-@ funded science departments that , of course , were Unix @-@ friendly at the time .

Despite NeXT 's limited commercial success , the company had a wide @-@ ranging impact on the computer industry . Object @-@ oriented programming and graphical user interfaces became more common after the 1988 release of the NeXTcube and NeXTSTEP , when other companies started to emulate NeXT 's object @-@ oriented system . Apple started the Taligent project in 1989 , with the goal of building a NeXT @-@ like operating system for the Macintosh , with collaboration from both Hewlett @-@ Packard and IBM .

Microsoft announced the Cairo project in 1991 ; the Cairo specification included similar object @-@ oriented user interface features for a coming consumer version of Windows NT . Although the project was ultimately abandoned , some elements were integrated into other projects . By 1994 , Microsoft and NeXT were collaborating on a Windows NT @-@ port of OpenStep ; the port , however , was never released .

WebObjects failed to achieve wide popularity partly because of the initial high price of US $ 50 @,@ 000 , but it remains the first and most prominent early example of a web application server which enabled dynamic page generation based on user interactions as opposed to static content . WebObjects is now bundled with OS X Server and Xcode .