

Chapter 15 Software in the 1990's

15.1 ... Microsoft

Operating Systems and Windows

See Appendix B for a description and release dates of the different versions of DOS.

Microsoft released Windows version 3.0 in May 1990 in New York City with a \$10 million promotional campaign. This version provided a new file manager, networking features, more desktop accessories, new screen appearance and new more recognizable icons. It was easier to install and provided an easier user interface for new users. Within four months a million copies were sold. It was a huge success.

Following the release and success of Windows 3.0, Microsoft had additional discussions with IBM in an attempt to improve its relationship with the company and its participation in the continued development of OS/2. In September an agreement was signed that IBM would take over most of the OS/2 development, Microsoft would work on an advanced future version 3.0 of OS/2 and IBM received limited rights to Windows. This resulted in Microsoft shifting programmers to Windows development. However by April 1991, Microsoft had abandoned OS/2 completely, and by 1992 the separation was final.

Object Linking and Embedding (OLE) was a new concept introduced into Microsoft products in 1990. It was also to be incorporated into a new operating system project with the code name of Cairo. Microsoft incorporated OLE Version 1.0 technology into PowerPoint in the summer of 1990 and to Excel in 1991.

In May 1991 Microsoft co-sponsored a new Windows World Exposition Conference.

Version 5.0 of MS-DOS was released in June 1991. This was an upgrade version only available from Microsoft that required a previously installed version of MS-DOS. It was a highly successful release. IBM had released its own version 5.0 but it had a number of problems. The success of the Microsoft products and

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other problems resulted in a further deterioration in the relationship with IBM during the latter part of 1991.

The highly successful Windows Version 3.1 upgrade with over 1,000 enhancements that included support for Object Linking and Embedding (OLE) and TrueType font technology was released in April 1992. It was in direct competition with the IBM release of OS/2 Version 2 in March. However the new release of Windows was a huge success that resulted in three million copies being shipped in the first six weeks after its introduction.

Microsoft announced Win32 in July 1992. Win32 is an application program interface with a 32-bit flat memory model, multithreading, preemptive multitasking, interprocess communication features and other advanced features.

Windows for Workgroups is a networking program with workgroup capabilities that was released as Version 3.1 in October 1992. It was not successful, and improvements were made that resulted in Version 3.11 being released in November 1993.

Version 6.0 of MS-DOS was released in March 1993 and OLE Version 2.0 in 1993.

Windows NT (New Technology) was announced in May 1993, and the first release was at Version 3.0. Windows NT is an advanced operating system for PC computers. It is a 32-bit system incorporating Win32 concepts with compatibility for applications written for MS DOS, Windows, OS/2 and POSIX. Other features included are: security protection to U.S. Government C-2 level, portability to different microprocessor architectures, symmetric multiprocessing support, built-in networking capabilities and support for international multilingual applications. The system will operate on Intel microprocessors, MIPS workstations and supports the DEC Alpha architecture. The software requires 12 to 16 megabytes of memory and a powerful microprocessor such as an Intel 486 or better. Windows NT is a sophisticated operating system for workstations and file server applications.

In August 1994, the U.S. Patent and Trademark office, approved a Microsoft request to register the label "Windows" as a trademark.

Various improvements were made to the Windows NT software under the code name of Daytona. The hardware requirements were reduced and the system reliability improved. This resulted in an upgrade Version 3.5 being released in September 1994.

The Consumer Products Division released what was called a new "social interface" with the product name of Bob in March 1995. This new easy to use user interface requires Windows, a 486 microprocessor and 8 megabytes of memory. It uses a living room setting metaphor with 12 "intelligent agents" or "friends" and 8 integrated programs. The "room" can be rearranged and customized by the user. An intelligent agent can be selected by the user to act as a guide through different tasks. The agents observe user actions and get to know the user and anticipate the persons needs. The eight integrated programs provide a calendar, checkbook, letter writer, address book, e-mail, financial guide, GeoSafari and household manager. The program has a price of \$100 and received mixed reviews.

Chicago was the product code name assigned to a new advanced 32-bit operating system. It evolved from Windows with some MS-DOS code and some features from Windows NT. It incorporated Win32 technology and was targeted at the mass consumer market. Microsoft released an extensive beta test of the new software starting in June 1994. Then after a number of delays the software was released as Windows 95 in August 1995. The program incorporated a new user interface, 255-character file names, preemptive multitasking, multithreading, support for "plug and play" to optimize hardware performance and integrated network connectivity to the new Microsoft Network (MSN). MSN provides on-line communication to commercial services and the Internet. Microsoft estimated that more than 1 million copies of Windows 95 were purchased by customers at retail stores during the first four days after the release.

Windows as a separate graphical user interface for MS-DOS essentially ended with the release of the Windows

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95 operating system. The functionality of MS-DOS and the previous Windows graphic user interface had been integrated in the new operating system.

WINPAD is a new operating system being developed for handheld computers.

Windows NT Workstation version 4.0 was released in July 1996. It combined the ease of use of the Windows operating system with the reliability and security of Windows NT. Windows NT Server is a powerful operating system foundation for server applications, such as BackOffice, that was released in 1996.

The Windows CE operating system, is a subset of the Windows family that was released in 1997. It was developed for a broad range of communications, entertainment and mobile devices.

Windows 98 that had a project name of Memphis was released in June 1998. It integrated Internet Explorer version 4 and supported numerous new device types. This was reported to be the last major version of Windows based on the old DOS system. Future versions of Windows will be based on NT technology.

Other Microsoft Product Releases

Microsoft Office was introduced in 1990. Initially it was a discounted suite of applications that consisted of Word, Excel and PowerPoint. The applications contained in the suit were subsequently changed to incorporate a standard user interface and improved integration features using Object Linking and Embedding (OLE) and Dynamic Link Libraries (DLL) technology. Version 4.0 of Office was released in October 1993. It contained Word 6.0, Excel 5.0 and PowerPoint 4.0, plus Mail and Access in the Professional Office edition. Office 95 was released with Windows 95 in August 1995, Office 97 in January 1997 and Office 2000 in June 1999. Microsoft offers various versions of its Office suite and has a dominant position in this market.

Microsoft issues upgrades to its application software to add improvements, new features and correct problems at one to two year intervals. Excel for Windows, Macintosh and OS/2 was improved with the release of Version 3.0 in January 1991, Version 4.0 in

March 1992 and Version 5.0 in October 1993. Word for Windows has also been improved with the release of Version 1.1 that included a grammar checker in November 1991, Version 2.0 in 1992 and Version 6.0 in October 1993. Microsoft moved from Version 2.0 to Version 6.0 to synchronize the Word for Windows version number with the MS-DOS version number. PowerPoint Version 3.0 shipped in May 1993 and Version 4.0 in October 1993.

Microsoft released Visual Basic for Windows in May 1991. Visual Basic is a graphical version of BASIC that simplifies the writing of programs for Windows. It was subsequently released in three editions: Standard, Professional and Enterprise.

Microsoft introduced a personal finance and home banking program called Money in 1991. Schedule + is an appointment, scheduling and list management program that was released in 1992.

Microsoft entered the database segment of the application software market when it acquired Fox Software and its advanced database program called FoxPro for \$173 million in March 1992. Then in November, Microsoft announced its own database program called Access at a significant discount to increase market penetration. These actions contributed to the financial difficulties of Borland International, who was a major supplier of database software for the personal computer market.

Microsoft at Work is a software and architecture technology for the connection of office equipment that was announced in June 1993. Equipment such as copiers, fax machines, hand-held devices, printers and telephones would be able to communicate with a personal computer using Windows software. Microsoft released a system for fax machines in January 1995. However, it was not successful.

BackOffice is an integrated series of server applications that enables users to access information from inside and outside an organization. It can be combined with a new system called Microsoft Exchange and the Office suites. Microsoft Exchange was released in beta test in February 1995. It is an extension of

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Microsoft Mail and is a groupware type of program that was developed to compete with Lotus Notes.

The company released a final version of Internet Explorer 2.0 for Windows 95 in November 1995. Version 3.0 was released in October 1996, Version 4.0 in September 1997 and Version 5.0 in March 1999.

Multimedia

The CD-ROM division established in 1985, became the multimedia publishing division in March 1992. After many delays and changes in project management, the encyclopedia with code names of Merlin and finally Gandalf shipped with the product name of Encarta in March 1993. Encarta now contains a 29-volume encyclopedia with 26,000 articles, an interactive atlas and an illustrated timeline of world history.

This division has and still is releasing many other multimedia CD-ROM products. Some of these are Ancient Lands, Art Gallery, Atlas, Cinemania, Complete Baseball, Dangerous Creatures, Dinosaurs, Isaac Asimov's The Ultimate Robot, Musical Instruments and disks on a number of musical composers.

New Developments

Microsoft is currently working on a number of systems that suggest a convergence of operating systems, application software, communication technology, personal computers and television. Some of these are the WINPAD operating system, TV set-top device software and Tiger cable-TV project. The Tiger project is a network server system to provide video-on-demand and interactive TV.

Microsoft's vision of "Information At Your Fingertips," "A Computer on Every Desk and In Every Home" and "Windows Everywhere" is becoming a reality.

15.2 ... Apple Computer and IBM

Apple Computer

Apple Computer released HyperCard IIGS in January 1991 and the System 7 operating system for the Macintosh computer in May.

In October 1991, Apple participated in the formation of the PowerPC Alliance with IBM and the creation of joint software companies called Kaleida to develop multimedia applications and Taligent to develop an advance operating system (See Section 19.6). Apple wanted to move in a direction that facilitated the interaction between their systems and IBM.

Apple Computer announced a new strategic plan in September 1994, that would expand the Macintosh technology base. The company had decided to open the Macintosh hardware and software by licensing the operating system to other computer vendors in January 1995. This licensing and an agreement with IBM and Motorola in November 1994, to create a new common hardware reference platform for computers based on the PowerPC microprocessor, was intended to increase market share. Another part of this overall strategy was to offer independent software developers a broader installed base to design applications for the Macintosh platform.

In February 1997, the company acquired NeXT Software, Inc. Apple obtained the NeXT operating system to replace its own future operating system with the code name of Copland that had been having technological problems. The new operating system based on Apple and NeXT software technology would have the code name of Rhapsody. Avidis Tevanian, who had been a principal in the software design at NeXT was placed in charge of the new operating system and became a senior vice president for software engineering.

Apple terminated the program to license the Macintosh operating system to other personal computer vendors and its support of the unified PowerPC platform in September 1997. The company had decided that the

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benefits of increased market share were more than offset by the costs of the licensing program.

A new operating system called OS 8 was released in July 1998. The new system featured multi-threading, PowerPC processor-native finder, spring-loaded folders, pop-up windows, contextual windows and an Internet Set Up Assistant. This was followed by the release of OS 9 in October 1999 with over fifty new features. Apple indicated that it intended to make a new release of the operating system each year with a major change on OS X (ten) in 2000.

IBM

In early 1990, James Cannavino had discussions with Bill Gates and Steve Ballmer regarding the possibility of Microsoft assuming full responsibility for OS/2 development. However the discussions were not successful. The release of the highly successful Microsoft Windows Version 3.0 in May 1990, had a further detrimental effect on OS/2 sales. Then in September IBM announced that it was taking over most of the responsibility for the development of OS/2. Around this time Cannavino appointed Joseph Guglielmi as a senior marketing executive for OS/2.

Cannavino received approval from the Corporate Management Committee (CMC) to remove Microsoft from any future development of OS/2 in early 1991. This position was announced in April, accompanied by a statement that a new version of OS/2 would run DOS applications better than DOS and Windows applications better than Windows. The announcement also stated that IBM would release the new version of OS/2 by the end of 1991. Coding in the new version was now being changed from assembler to the "C" programming language.

In October 1991, IBM participated in the formation of the PowerPC Alliance with Apple Computer and the formation of joint venture companies called Kaleida and Taligent to develop multimedia applications and an advance operating system (See Section 19.6). IBM wanted to share Apple's expertise in personal computer software development and provide an alternative to OS/2 and Microsoft systems.

Problems accommodating Window applications delayed the release of OS/2 Version 2.0 to March 1992. It included the graphics Presentation Manager user interface. The price had been reduced to a low of \$35 for Windows users, \$99 for DOS users and \$139 for all others. However sales of the new Version 2.0 were well below expectations. Also affecting sales was the lack of application programs from other software companies for the new operating system.

OS/2 Warp Version 3 was released in October 1994.

15.3 ... Other Software

Corel

Corel Corporation introduced new versions of its highly successful graphics program CorelDRAW in the 1990's. Corel initiated a unique marketing strategy for CorelDRAW by marketing several versions of the program simultaneously. Version 2 was introduced in November 1990, Version 3 in May 1992, Versions 4 and 5 in May 1993 and May 1994 respectively, then Version 6 in August 1995. Corel entered the home consumer multimedia CD-ROM market in April 1995. Then after the acquisition of the WordPerfect and related software in February 1996, the company released the Corel WordPerfect suites and applications.

Digital Research

Digital Research released Version 5.0 of DR-DOS in April 1990 followed by Version 6.0 in 1991. Then after Digital Research was purchased by Novell, Inc., in 1992, DR-DOS became Novell DOS.

Linux

Linus Torvalds, a 21-year-old student at Helsinki University in Finland, developed an experimental version of the UNIX operating system in 1991. Torvalds posted the source code on the Internet and named the new operating system Linux. This open-source software was widely disseminated and improved upon by many users. By 1992 it was functioning on Intel processors, had a

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graphical user interface and had about 1,000 users. By 1995, networking capability had been added, the system had been modified to run on other processors and now had an estimated 500,000 users. In 1998 the number of users was estimated to be 7,500,000.

The dominant commercial supplier of the Linux operating system software, is Red Hat Software Inc., that was founded in early 1995 by Bob Young and a former IBM software engineer named Marc Ewing. The company provides manuals, support and other services for the Linux operating system.

Lotus

Notes is a communications program developed in the mid 1980's by Iris Associates Inc., which was a research group that spun off from the Massachusetts Institute of Technology. Raymond Ozzie was a principal in the development of the software and president of Iris Associates. The software technology was bought by Lotus Development Corporation in 1988 and released with the name of Lotus Notes in 1990. The software enables the connection of multiple personal computers, to share databases, files and provides advanced e-mail capabilities. It is also called groupware. It facilitates collaboration by communication and sharing of information between groups of people. This software was one of the significant reasons for IBM to purchase Lotus Development Corporation in 1995.

Mosaic

In 1993, Marc Andreessen a young undergraduate student and Eric Bina, developed a graphical browser for the World Wide Web (WWW) called Mosaic at the National Center for Supercomputing Applications (NCSA) located at the Urbana-Champaign campus of the University of Illinois. Mosaic provided a more visual form of WWW hypertext presentation, support for images and an intuitive user interface for a non-technical user. The software was developed for use on a UNIX operating system then translated into versions for the Apple Macintosh and IBM PC computer platforms. The program was

distributed free over the Internet and received widespread use.

In August 1994, a small company located in Illinois, called Spyglass, Inc., that was founded by Tim Krauskopf in 1990, obtained the exclusive rights to license Mosaic software.

Netscape

When James H. Clark was leaving Silicon Graphics in January 1994, he told a friend that he wanted to start a new high technology company. The friend suggested he contact Marc Andreessen, who had just graduated from the University of Illinois in December 1993, where he codeveloped the Mosaic browser. Clark met Andreessen and after considering various ventures, Clark decided to finance a new company to exploit the commercial possibilities of a Mosaic type browser. Clark founded Mosaic Communications Corporation in April 1994.

Andreessen and Clark had recruited the other key team members from NCSA that developed Mosaic and a few personnel from Silicon Graphics. They then completely recreated the Mosaic browser with additional features, improved performance and stability for the UNIX, Apple Macintosh and PC computer platforms. The company released the beta version of the browser they named Mosaic Navigator in October 1994. This beta release was available free by downloading from the Internet.

In the fall of 1994, the University of Illinois demanded that Clark provide financial compensation for using their technology or intellectual property and to stop using the name Mosaic. This resulted in the company name being changed to Netscape Communications Corporation in November. Then to avoid litigation, an agreement was reached with the university that provided an undisclosed financial settlement in December. The first production version 1.0 of the browser was shipped in December with a new name, Netscape Navigator. "By spring, more than 6 million copies had been downloaded by users all over the world" [134 -page 4].

James L. Barksdale joined the company as president and chief executive officer (CEO) in January 1995 and the company went public in August. Other products that

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became popular tools for server and authoring Web data were also developed. Navigator 2.0 with integrated e-mail was released in September and version 3.0 with Internet telephone in April 1996. The Communicator Professional with HTML authoring and group calendar was released in June 1997.

Since the founding of the company, Clark had misgivings about future competitive actions by Microsoft. Between September and December of 1994 there was an interchange of communications for Microsoft to license the Netscape browser. However, Microsoft decided to license Mosaic from Spyglass. In the spring of 1995, Clark stated that Microsoft was withholding application programming interface (API) information applicable to Windows 95 that Netscape required for release 2.0 of its browser. In June, Microsoft advised that the API's would be provided if they could obtain an equity position and a seat on the board of Netscape. Clark rejected the offer and obtained legal counsel. This and other uncompetitive activities led to the antitrust action against Microsoft by the Department of Justice in 1977. Clark's concern for the future viability of Netscape led to his consideration of forming an alliance or sale of the company in 1997. America Online completed the acquisition of Netscape Corporation at a cost of \$4.3 billion in March 1999.

Novell

After acquiring Digital Research in 1992, a new version of DR-DOS with improved networking capabilities was released as Novell DOS 7 in December 1993. Novell, Inc., sold its WordPerfect word processing program and related suite software to Corel Corporation in January 1996. Corel paid \$10.75 million and 9.95 million shares of its common stock for the acquisition.

Sun

In 1991, a small research group was created at Sun Microsystems that conceived the development of a new system for the consumer market. The system would include a portable consumer device and an operating system that could interact with any other system. James Gosling was assigned to develop the operating system that became a project code-named Oak. Project Oak evolved into a platform-independent programming language and operating system for consumer electronic products. In 1994, the language design was repositioned so it could be used to build interactive applications for the Internet. The language was named Java and was introduced in May 1995.

Java is based on the C and C++ languages that has evolved into a general purpose language. It is portable to a variety of hardware platforms and operating systems. It is supposedly a "write once, run anywhere" language. Java is both a programming language and an environment for executing Java programs that has received wide spread use. This use has been increased by Sun posting the language on the Internet for free downloading by programmers. The language has also been licensed by a number of large companies such as Apple Computer, IBM, Microsoft, Netscape and Oracle.

Microsoft licensed the Java programming language technology from Sun in March 1996. Then in October 1997, Sun started litigation against Microsoft regarding its implementation of the language and the compatibility requirements of the license agreement. This action was supported by the court with a preliminary injunction siding largely with Sun in November 1998.

In mid 1998, Sun introduced a sister technology to Java called Jini. Jini was developed by a Sun research group led by William Joy. Jini enables a digital device to be connected into a computer network, identify itself and its parameters. It allows for a group of electronic devices to collaborate and combine to form a complex system.

WordPerfect

WordPerfect Corporation introduced DrawPerfect, a business presentation graphics program in February 1990 and a smaller version of WordPerfect named LetterPerfect in June. In May 1990, the company announced a change in emphasis to release a version of WordPerfect for Microsoft Windows ahead of a version for the IBM OS/2 operating system. The company had misjudged the market acceptance of OS/2 and Windows. WordPerfect for Windows was not released until November 1991 and an OS/2 version was delayed until 1993.

Yahoo!

David Filo and Jerry Yang were graduate students at Stanford University, when they created a web site and a free guide to the World Wide Web (WWW) in early 1994. The guide began as a list of their favorite Web sites and by the summer had tens of thousands visitors daily. As the list grew it was broken into a directory of search categories, then subcategories. Filo and Yang manually designated the categories as compared to computer generated indexes being created elsewhere. This resulted in an intuitive and a more selective means of locating information.

It was in the summer that they selected the name Yahoo! for the search engine. Yahoo! is a whimsical acronym for "Yet Another Hierarchical Officious Oracle." By the fall the number of Yahoo! users had increased dramatically, but they had no revenue.

In the spring of 1995, Filo and Yang approached Don Valentine's venture capital company, Sequoia Capital, and obtained \$4 million of finance capital for Yahoo! Inc. Shortly after they started to hire a business team and Timothy Koogle was recruited as president and chief executive officer. Koogle quickly moved to correct the revenue side of the business that resulted in a new look for Yahoo! in August. This included the addition of advertising, a major change in the hierarchy with a reduction in the top level to 14 major search categories and the addition of a Reuters news service. Other services such as weather information and stock quotes were subsequently added.

In the fall of 1995, a second round of investment financing for \$40 million was arranged. Two of the strategic investors were Reuters and the Softbank Corporation. In early 1996, Masayoshi Son of Softbank increased his investment in Yahoo! to obtain approximately 30% ownership. The company went public in April 1996 and Filo and Yang each ended up with over 15% of the company. Koogle has built Yahoo! into a powerful portal for e-commerce.

15.4 ... The Road Ahead

Gates book *The Road Ahead*, [89] articulates the future direction of software and new technology as seen by the chairman of the dominant supplier of software for personal computers. Terms such as cable-TV, information highway, information utilities, intelligent agents, interactive TV, multimedia, networks, social interface and video on demand all suggest a future direction for software development. Programming languages dominated the 1970's, application programs and operating systems the 1980's. The 1990's is adding significant capabilities for communication of information. Research to facilitate the use of computer technology will provide an extension of the mass consumer market to include novice home users. Software will be the technology that provides the synthesis to extend personal computing.

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