Chapter 12 Microsoft in the 1980's

As Microsoft entered the 1980's, it derived most of its revenue from the sale of BASIC interpreters. In the next few years this would change significantly.

12.1 ... Corporate & Other Activities

1980 Activities

In early 1980 Microsoft decided to get into operating systems and acquired a license for UNIX from AT&T (see Sections 2.6 and 12.3). Then in March, Microsoft introduced their new Z-80 SoftCard (see Sections 6.4 and 17.6) at the West Coast Computer Faire. This CP/M interface card for the Apple II computer was an immediate success.

In 1980, Steve Wood who was the general manager, decided to leave and go to Datapoint. Gates replaced him with an old friend Steven A. Ballmer, as assistant to the president in June 1980.

A phone call from IBM in July 1980 was to have a major impact on Microsoft. Initially an inquiry to obtain programming languages for the proposed IBM PC computer, it evolved into a requirement that included the Disk Operating System and application software (see Section 12.2).

Starting in November 1980, David F. Marquardt of Technology Venture Investors had discussions with Microsoft regarding a plan to change the partnership into a corporation. This resulted in Microsoft becoming Microsoft, Inc., in June 1981. The ownership and percentage of shares was divided between the principals as follows: Bill Gates 53, Paul Allen 31, Steve Ballmer 8 and Vern Raburn 4. Then in September, Technology Venture Investors purchased 5 percent of the company for $1,000,000.

Apple Macintosh

Steve Jobs and other members of the Apple Macintosh development team had discussions with Microsoft between spring and August of 1981. Jobs wanted Microsoft to supply application software for the new Macintosh computer. Then in October 1981, Gates and members of the Microsoft application group visited Apple for a demonstration of the Macintosh computer. This demonstration impressed Microsoft with the future potential of the Macintosh.

Radio Shack Model 100

During 1981, Kay Nishi through a Japanese associate evaluated an 8-line by 40-character liquid-crystal-display(LCD) from Hitachi. Nishi and Gates decided that this would form the basis for a general-purpose portable computer. They developed a specification for the machine that would include a BASIC interpreter, word processor, communication program and address book in ROM. Then in 1982, they decided to have Kyoto Ceramics (Kyocera) of Japan manufacture the computer. The planning determined a scheme for the world-wide marketing of the computer. In the Far East it would be by NEC as the PC-8200, in Europe by Olivetti as the M-10 and in the Americas by Tandy Radio Shack as the Model 100. Microsoft would receive a royalty on each unit sold. Radio Shack released the Model 100 in March 1983. It became the first laptop computer.

Relocation and Administrative Changes

In November 1981 the number of employees at Microsoft had increased to 100. Two new employees in 1981 were Jeffrey (Jeff) S. Raikes, a Stanford MBA who had been with Apple Computer and Chris Peters. Both would subsequently become vice presidents of Microsoft. The company had also moved to a new office building in Bellevue. Then in July 1982 Microsoft hired its first President, James C. Towne. Towne was an executive at Tektronix, a manufacturer of oscilloscopes and test equipment. Gates became executive vice president, with responsibility for all product related activities, and remained chairman of the board and CEO. However after a

short period of time Towne did not satisfy Gates who started looking for a replacement.

Other 1982 Activities

In January 1982 Microsoft signed an agreement to supply Apple with a spreadsheet, a business graphics program and a database. In the agreement Jobs had a clause added restraining Microsoft from releasing similar graphics application software to other customers for a twelve month period after the introduction of the Macintosh. Gates amended it to be no later than January 1983. Apple then provided prototypes of the Macintosh to Microsoft for software development.

By early 1982 Tim Paterson had completed an update to the PC operating system that increased the disk capacity from 160 to 320K bytes. At the end of March he left Microsoft and returned to Seattle Computer Products. Subsequently he started his own company called Falcon Technology.

Scott D. Oki, an MBA graduate from the University of Colorado, joined Microsoft in early 1982. Shortly after he presented a business plan for an international group to handle marketing and sales outside the USA. Gates approved the proposal and Oki became director of international operations in September. Microsoft International was a success, and became a significant source of revenue and profits for Microsoft.

During 1982, it became apparent to Microsoft that they required a graphical user interface for their disk operating system. Apple Computer had demonstrated the Macintosh system to Microsoft in late 1981 and VisiCorp had displayed their new VisiOn system in the fall of 1982. This started the development of a new graphics user interface for DOS that would become Windows (see Section 12.4).

In early 1982, Microsoft reached an agreement with Compaq to supply MS-DOS and BASIC software. Compaq required the software for a portable computer, that would be the first IBM compatible computer. The software compatibility, had a potential for conflict with IBM. Microsoft could now sell the BASIC interpreter for use on other IBM clones. Microsoft also reached agreements

with Hewlett-Packard and Digital Equipment Corporation to supply software during 1982.

Figure 12.1: William H. Gates and Paul G. Allen. Photograph is courtesy of Microsoft Corporation.

In September 1982, Paul Allen was on a European trip with Gates when he developed some lumps on his neck. The diagnosis determined that he had Hodgkin's disease. After treatment Allen decided to resign from Microsoft in February 1983. Allen started his own software company called the Asymetrix Corporation in 1985.

Microsoft signed a number of contracts for its software products during 1982. A BASIC interpreter for Hitachi in Japan and MS-DOS for Victor Technologies are examples of programs that generated significant revenue for Microsoft.

In late 1982, Vern Raburn left Microsoft and joined Lotus Development Corporation as general manager. By the end of 1982, Microsoft employment had doubled to 200 employees and sales were $34 million.

During 1982/83, Microsoft did extensive development of the Macintosh software. Microsoft had numerous difficulties. The operating system and graphics user interface were in transitional development. The hardware changes such as screen resolution, disk drive configuration and the amount of memory delayed software development.

1983-85 Activities

Initial proposals for the formation Microsoft Press evolved in March 1983. The concept was to establish a publishing facility that would provide high quality computer texts and enhance Microsoft marketing efforts. The first manager was Nahum Stiskin, then Min S. Yee in May 1985.

Microsoft hired Raleigh Roark in 1982, to be in charge of hardware development. He became a principal in the development of the Microsoft mouse. David Strong, a Seattle designer, styled the mouse. Then a Japanese company called Alps Electric developed it into a product that Microsoft introduced in May 1983. Two versions were available: a mouse for the IBM Personal Computer powered from the computer bus through an add-on board and a mouse that obtained its power from the computer serial port. The mouse and interface software had a price of $195.

By early 1983, differences in the management of the company had developed between Gates and James Towne. This resulted in Towne leaving Microsoft in June. Microsoft offered Jon A. Shirley the presidency of Microsoft at the May 1983 National Computer Conference in Anaheim. He was the vice-president of computer merchandising at Tandy Corporation and had been with the company for twenty-four years. He accepted the offer in June and became the president and chief operating officer of Microsoft in August.

Microsoft also hired Rowland Hanson in early 1983 as vice president of corporate communications. Hanson implemented changes to enhance the corporate image of Microsoft. One change was a new orientation in the product naming policy to emphasize the company name. For example the word processor name changed from Multi-Tool

Word to Microsoft Word and the Interface Manager became Microsoft Windows. Frank M. (Pete) Higgins also joined the company in 1983 and subsequently became a vice president of Microsoft.

MSX was an 8-bit software/hardware system initiated by Kay Nishi for the Japanese market. The MSX computer system used a Z-80 microprocessor with graphics, sound, color-TV output and included a BASIC interpreter. Tim Paterson developed an 8-bit version of DOS called MSX-DOS for the computer system. Microsoft announced the MSX system in June 1983.

Microsoft concluded a new agreement with Apple Computer just prior to the release of the Macintosh computer in January 1984. It canceled the previous agreement of January 1982 and allowed Microsoft to market its own programs for the Macintosh computer. They announced Multiplan and Microsoft BASIC for the Macintosh at the computer release in January. However due to a lack of testing, the software had problems. Then in December, Microsoft released the Chart and File programs for the Macintosh in December. The company also started to adapt Microsoft Word to the Macintosh computer.

Between 1982 and 1985, Bill Gates featured in several magazines. It started with the cover of *Money* magazine in November 1982. In 1984 there was an article in the January issue of *Fortune* magazine. Then early in the year he had a profile in the *People* magazine and in April he was on the cover of *Time* magazine. Then in February 1985, he featured in the *Good Housekeeping* magazine. He was becoming a national figure. The marketing group were fostering this publicity of Gates. They also promoted concepts such as: "Microsoft Aims to be the IBM of software" and "a computer on every desk and in every home."

Gates had been directing most of the software development. However the scope of this responsibility was affecting his effectiveness. In August 1984, Jon Shirley implemented a reorganization to place Steve Ballmer in charge of the Systems Division. Also, Microsoft recruited Ida Cole from Apple Computer to be in charge of the Applications Division. Shirley also

hired Francis J. Gaudette as vice president of finance and administration in September, to organize the financial activities of the company.

In February 1985, Ida Cole became a vice president of Microsoft in charge of application software. Then in 1986, her responsibilities changed from application software to international products.

In the fall of 1985, Apple Computer started expressing legal concerns regarding the similarity between Windows and the Macintosh user interface. Microsoft had also expressed concern regarding the development of MacBASIC by Apple. This resulted in meetings between Gates and Sculley. Shortly after the release of Windows, they signed an agreement in November that permitted Microsoft to use certain visual features of the Macintosh and Apple Computer stopped development of MacBASIC.

During 1985 Microsoft initiated actions to evaluate and adapt CD-ROM and multimedia technology. One of the significant problems was the use of the Philips CD-I (Compact Disk - Interactive) disk format and its interface with MS-DOS. This resulted in Raleigh Roark being assigned to head a CD-ROM group that developed a disk format named MS-CD for MS-DOS and Macintosh computers. Then in November, Microsoft was a participant in the adaptation of the High Sierra Proposal for a standardized disk format. Microsoft also contracted with the Cytation company to develop a multimedia encyclopedia for a planned CD-ROM conference.

1986-89 Activities

In January 1986, Microsoft bought Cytation and appointed its founder Tom Lopez as head of a new CD-ROM division. Cytation's CD-ROM reference disk called CD-Write was renamed Bookshelf. Then in March, Microsoft sponsored the first CD-ROM conference in Seattle, Washington. At the March 1987 CD-ROM conference, Art Kaiman from the RCA company demonstrated Digital Video Interactive (DVI) technology recorded on a CD-ROM disk. It was an impressive multimedia display running on an IBM computer using the Microsoft disk operating system.

Figure 12.2: Microsoft headquarters in Redmond, Washington.
Photograph is courtesy of Microsoft Corporation.

Construction of new headquarters had began in 1985. The new location was a 400-acre wooded site known as Sherwood Forest in Redmond, Washington. The initial buildings were completed and Microsoft moved to the new corporate campus in February 1986.

During 1984/85 Microsoft was under increasing pressure to make a public offering of the company shares. The employees stock incentives required a market to realize the true value for their shares. Also at a certain number of stock holders the Securities Exchange Commission would be requiring Microsoft to register the stock. Microsoft selected Goldman Sachs & Company and Alex. Brown & Sons to underwrite the public offering in December 1985. The prospectus showed that the largest shareholders were Gates, Paul Allen, Steve Ballmer and Technology Venture Investors. Gates owned forty-nine percent of the shares and Paul Allen twenty-eight percent. Other major stockholders included Gordon

Letwin, Jon Shirley, Charles Simonyi, and Gates parents. An offering price of $21 a share was established and the stock first traded to the public in March 1986. On the first day of trading the shares opened at $25.75 a share, peaked at $29.25 and closed at $27.75. Gates share of the company was worth over $300 million on the first day of trading. The stock continued to rise and by 1987 Gates was a billionaire.

About this time Gates has stated "...I proposed to IBM that they buy up to 30 percent of Microsoft -- at a bargain price -- so it would share in our good fortune, good or bad." Gates hoped this would help resolve some of the difficulties Microsoft was having, with the IBM joint development for the new OS/2 operating system. However IBM declined the offer.

Shortly after the public stock offering, Gates terminated the East Asia marketing agreement with Kay Nishi. Gates then recruited Susumu Furukawa from Nishi's ASCII Corporation to be the head of a new Microsoft Japanese subsidiary. Gates then recruited Chris Larson. He was an old friend from Lakeside School and helped establish the new subsidiary in Japan. Another important addition to Microsoft staff in 1986, was Paul A. Maritz who would subsequently become a vice president of Microsoft.

Microsoft encountered additional legal problems with the MS-DOS licenses held by Seattle Computer Products and Falcon Technology in 1986. Tim Paterson had started Falcon Technology after leaving Microsoft and Seattle Computer Products. Both were having financial problems and were considering selling the rights to their licenses. Microsoft obtained the Falcon license by purchasing the company in early 1986. Microsoft then obtained the license held by Seattle Computer Products, in an out-of-court settlement during litigation in December. The purchase of the license rights cost Microsoft about $1 million each.

Microsoft acquired Dynamical Systems Research, Inc. and its personnel in June 1986, for $1.5 million in Microsoft stock. Microsoft bought the company to obtain a clone of the IBM TopView software. Two principals in the company were Nathan P. Myhrvold, who would

subsequently become a vice president of Microsoft, and Dave Weise. Microsoft also acquired Forethought, Inc., from its founder Rob Campbell for $12 million in July 1987. The reason for the acquisition was to obtain the PowerPoint graphics presentation program for the Macintosh computer.

In March 1988, Apple Computer filed a lawsuit claiming that Microsoft Windows Version 2.03 and Hewlett-Packard's NewWave programs copied the "look and feel" of the Macintosh. Speculation stated that Apple was really trying to inhibit or counteract development of the IBM Presentation Manager graphical user interface. Microsoft filed a countersuit against Apple for slander with intent to inhibit Windows development. In March 1989 the judgment on the lawsuit favored Apple and sent the Microsoft stock into a steep decline. Additional litigation resulted in the number of items in contention being significantly reduced. Then in July 1989, the judge threw out 179 items of alleged similarity. This left only 10 items in dispute.

Microsoft reorganized the CD-ROM division in mid 1988 and changed the name to Multimedia Systems division. Then Rob Glaser replaced Tom Lopez who had started the CD-ROM division. In October, Intel purchased the Digital Video Interactive (DVI) system demonstrated at the 1987 Microsoft CD-ROM conference.

By 1988 application software such as the Windows word processor project Cashmere and the Windows database project Omega were not meeting schedules. Consequently Microsoft hired Michael J. Maples who had responsibilities for software strategy at IBM, as vice president of the applications division in June. Then in 1989, Maples reorganized the applications division into smaller business units with a narrower market focus.

Between 1988 and 1989, Gates acquired between four to five acres of lakefront property at a cost of about $5 million. Located on Lake Washington, it would be the site of his future luxurious home.

In March 1989 Microsoft purchased close to 20 percent of Santa Cruz Operation (SCO), Inc., for a reported $25 million. Santa Cruz had previously ported the XENIX operating system software to other computers

for Microsoft. However more important strategically, Santa Cruz was a member of the Open Software Foundation (OSF) that Microsoft had chosen not to join. Then another significant event with a potential effect on Microsoft occurred. IBM purchased a license for the UNIX based NeXTSTEP operating system.

Microsoft also acquired a California company called Bauer in July 1989. The company specialized in printer technology that included TrueImage fonts and printer driver software.

In September 1989 Gates incorporated his own separate company called Home Computer Systems. Gates founded the company to analyze the potential market for a mixture of electronic media and a photo data base of still art. The company subsequently arranged contracts with institutions such as the National Gallery of London and the Seattle Art Museum. The company name changed subsequently to Interactive Home Systems, which became Continuum and then to the Corbis Corporation.

At the end of Microsoft's 1989 fiscal year in June, net revenue was $803.5 million and the number of employees 4,037. Systems and languages accounted for 44 percent of revenue, applications 42 percent and hardware and books the remaining 14 percent. Geographically domestic revenue was 43 percent and international revenue 55 percent. Then in December 1989, it was announced that Jon Shirley wanted to retire in June 1990. A search began for a suitable replacement.

12.2 ... IBM PC Software

Initial Discussions

Bill Gates received a phone call from Jack Sams of IBM in late July 1980. Sams was a member of the small project team doing the initial concept analysis for a proposed personal computer. He was in charge of software development and arranged a meeting for the next day at Microsoft. IBM had Microsoft sign a nondisclosure agreement. This first meeting with Gates and Ballmer was of a general exploratory nature by IBM, to evaluate

Microsoft capabilities. IBM did not disclose any requirements specific to the proposed computer at this meeting. However, Sams did recommend to his manager William Lowe, that they use Microsoft software.

In mid August, after the IBM Corporate Management Committee (CMC) approved the personal computer project, IBM requested a second meeting. IBM had Microsoft sign a more detailed nondisclosure agreement and both companies had legal representatives at the meeting. IBM now revealed details of project Chess and the proposed personal computer with the code name of Acorn. IBM also advised that they wanted Microsoft to supply a series of programming languages for the new computer: BASIC, COBOL, FORTRAN and Pascal. IBM required the BASIC software by April 1981.

Operating System

During the mid-August West Coast trip, IBM attempted to negotiate with Digital Research to obtain the CP/M operating system for the Acorn computer project. However Digital Research would not sign the IBM nondisclosure agreement. Another factor affecting Digital Research's involvement was that they were not committing company resources to releasing a 16-bit version of CP/M till sometime next year.

Then in late August, IBM and Microsoft discussed alternative operating systems that could replace CP/M. The XENIX operating system was available from Microsoft, but the Acorn computer would not have the resources required by the software. However Paul Allen had been aware by early August of the 16-bit operating system developed by Tim Paterson at Seattle Computer Products. Paterson had developed the software called QDOS (Quick and Dirty Operating System) for use with the company's 8086 card system. QDOS had many similarities to CP/M but used a file allocation table (FAT) developed by Microsoft for controlling the disk file format and space allocation. IBM was now encouraging Microsoft to supply the operating system. In September, Microsoft made an agreement with Seattle Computer Products to license the 16-bit operating system. Seattle Computer Products now

called the software 86-DOS (Disk Operating System). The license fees cost Microsoft a total of $25,000.

The Contract

In late September, Gates gave a presentation to IBM in Boca Raton, Florida formalizing their proposals to supply the languages requested and an operating system. Following the presentation legal negotiations proceeded to specify the terms for price, delivery and licensing. Microsoft and IBM signed the contract for the software in early November 1980. Microsoft would supply BASIC, COBOL, FORTRAN, Pascal, an Assembler and a Disk Operating System (DOS). A significant item in the contract provided Microsoft with marketing rights to sell the operating system to other companies. IBM wanted the disk operating system by January 1981. Microsoft was already behind schedule.

Software Development

Microsoft now started using the Intel 8086 simulator program, that they started developing in 1978, for software development on the Acorn prototype. IBM did not deliver a prototype of the Acorn computer until December. The simulator program allowed Microsoft to start software development and continue when they had reliability/availability problems with the Acorn prototype.

A top priority at Microsoft was the development of the operating system. Final testing of the programming languages and other application programs required a functional operating system. Microsoft assigned Bob O'Rear to adapt the 86-DOS to the specific requirements of the Acorn computer and the Basic Input/Output System (BIOS) software. O'Rear had started at Microsoft in 1977. He was now working with Tim Paterson at Seattle Computer Products and David Bradley at IBM who was developing the BIOS. Paterson developed a simple text editor called EDLIN that Microsoft included in the DOS program. A preliminary version of 86-DOS was operating in February 1981. Paterson left Seattle Computer Products and joined Microsoft in May.

Digital Research became aware of the adaptation of 86-DOS to the IBM computer project. They were now expressing their concern regarding the similarity of 86-DOS to CP/M. To avoid potential litigation IBM agreed with Gary Kildall of Digital Research to offer his CP/M-86 operating system for the new computer.

The preceding developed concerns at Microsoft regarding the control of 86-DOS. In June 1981, Microsoft made an offer to Rod Brock, the owner of Seattle Computer Products to purchase the 86-DOS software. In July, Microsoft signed an agreement that purchased all rights to 86-DOS for an additional $50,000. The total cost, after including the initial license fee of $25,000 was $75,000.

Microsoft agreed to provide Seattle Computer Products with unlimited rights to the operating system and future improvements for use in their products. The agreement also provided beneficial terms for other Microsoft programming languages.

IBM released the operating system as PC-DOS in August 1981 and as MS-DOS by Microsoft. Microsoft subsequently either licensed or released other versions of the operating system, with different names such as SB-86 and ZDOS.

Other Software

The other urgent requirement from Microsoft was for the ROM BASIC. Mike Courtney, a previous developer of APL at Microsoft, worked on the BASIC interpreter. Paul Allen worked on the advanced versions of BASIC that included DISK BASIC. Gates also got involved in certain aspects of the software. Microsoft finished the ROM BASIC in March 1981.

Microsoft hired Richard Leeds in June 1981 and assigned him to develop a 16-bit version of COBOL for the IBM PC. Microsoft offered other programs being sold by their Consumer Products Division to IBM. Those were Adventure, Olympic Decathlon, Time Manager and Typing Tutor. Also offered was a spreadsheet program just being developed at Microsoft called Electronic Paper.

12.3 ... Operating Systems

XENIX

Gates obtained a license for a standard version of the AT&T UNIX operating system in February 1980. Microsoft then adapted the operating system for 16-bit microcomputers and announced it as XENIX in August. Microsoft hired a company called Santa Cruz Operation (SCO), Inc., to port the software to various computers. One of the first customers for XENIX was the 3Com Corporation that Bob Metcalfe had co-founded in 1979.

Microsoft introduced Version 3.0 of XENIX in April 1983. Then Microsoft released XENIX 286 in August 1984 for the IBM PC AT computer.

Subsequent IBM Activities

After the introduction of the IBM PC computer in August 1981 Microsoft licensed the 16-bit operating system to Lifeboat Associates. They were a major software vendor and sold the operating system under the name of Software Bus-86 (SB-86).

Microsoft now sold the operating system to many OEM customers who were developing Intel 16-bit computers. The operating system sold initially with different names depending on the source. Microsoft used MS-DOS, IBM PC-DOS, Lifeboat Associates SB-86, Zenith ZDOS and so on. Later Microsoft would restrict this proliferation of names and insist on MS-DOS for all implementations other than IBM.

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

MSX-DOS

Tim Paterson developed an 8-bit version of MS-DOS called MSX-DOS. Microsoft developed the software for the MSX hardware system and released it in June 1983.

OS/2 and IBM

Microsoft participated in meetings of an IBM task force formed to evaluate operating systems for their personal computers. In June 1985 Microsoft and IBM

signed an agreement to jointly develop a new operating system for future products. Initially the new operating system had the name of Advanced DOS. This joint development agreement resulted in many difficulties for the two organizations. Then the accidental death of Don Estridge of IBM in August and his replacement by William Lowe did not help. IBM's bureaucratic type of organization for software development was in contrast to Microsoft's use of a small group of talented programmers. Gordon Letwin was in charge of the Microsoft development group.

In April 1986 Microsoft agreed to modify the Windows software to accommodate IBM's requirements for the new operating system. They also agreed to provide Windows compatibility for IBM's TopView applications. This resulted in Microsoft acquiring a company called Dynamical Systems Research, Inc., that had developed a TopView clone called Mondrian.

During 1986/87 a number of developments at IBM resulted in additional difficulties at Microsoft. In mid 1986, IBM advised Microsoft of a new concept being implemented, called Systems Application Architecture (SAA). This software would enable the linking of various hardware levels, from personal computers to mainframes. Following the SAA advisement, Microsoft became aware of the new IBM personal computer hardware incorporating the Micro Channel Architecture (MCA) bus and an Advanced Input/Output System (ABIOS) chip. IBM also advised Microsoft that they were developing an Extended Edition of the new operating system. However they also stated that IBM would develop the software without the participation of Microsoft. These changes had a significant impact on the joint software development activities for the new operating system

In April 1987, IBM announced that the new operating system with the name of OS/2 (Operating System/2). Also, IBM had selected the name Presentation Manager for the graphical user interface and would subsequently incorporate it as a part of OS/2. These activities had effectively negated Microsoft's development efforts under the joint development agreement. It also was having a serious impact on the

future potential of Windows. IBM released OS/2 Version 1.0 in November 1987, for the IBM PS/2 computer and other computers using the Intel 80286 and 80386 microprocessors. Presentation Manager was finally released in October 1988.

During 1989, the relationship between IBM and Microsoft did not improve. James Cannavino, who had replaced William Lowe as head of the IBM Entry Systems Division was also concerned about the relationship. However, Microsoft was now concentrating on a new version of Windows.

NT (New Technology)

During the deterioration in the relationship with IBM between 1987 and 1988, Microsoft initiated a new project called Psycho to develop a future operating system that would replace OS/2. Nathan Myhrvold headed the project that would incorporate portability with capabilities to accommodate reduced instruction set computing (RISC) technology. Myhrvold then licensed a UNIX based operating system technology called Mach. The project would now incorporate features of Mach, an ability to run on different microprocessors and systems with multiprocessors.

Then in October 1988, David N. Cutler who had been a principal in the design of the DEC Virtual Memory operating System (VMS) for VAX computers joined Microsoft. Cutler and his design team started working on the new operating system that Microsoft named NT, representing New Technology.

12.4 ... Windows

The advance demonstrations of the Apple Macintosh computer graphics system during 1981, and the VisiCorp demonstration of VisiOn at COMDEX in November 1982, added impetus to the development of a graphical user interface at Microsoft. VisiCorp had established a lead in the development of a graphical multi-window operating environment using the mouse.

Microsoft had started a project called Interface Manager in late 1981. However with the new competitive developments, Microsoft reviewed and extended the specifications of the interface in late 1982. Rao Remala became responsible for the window manager and Dan McCabe did the graphics. An intensive marketing effort began to advise OEM customers that Microsoft also had a graphical windows software system under development. However Gates could not obtain the support of IBM, who decided to develop their own interface that would become TopView. Related events in early 1983, were the introduction of the Apple Lisa computer with its innovative graphics in January, and the release by Microsoft of DOS Version 2 for the IBM PC XT computer in March. A primitive demonstration of the Interface Manager program was developed by McCabe and Remala in April. By summer, a change in corporate marketing strategy resulted in the program being renamed Microsoft Windows.

In the fall, Charles Simonyi recruited Scott MacGregor whom he had known at Xerox PARC to be the head of the Windows development team. The team now included Marlin Eller, a mathematician, and Steve Wood. Eller would develop the graphical device interface, Remala the user interface and Wood the system kernel. In November, Microsoft announced Windows in New York. That same month VisiCorp released VisiOn and Quarterdeck announced a graphical system called DESQ.

At the 1983 fall COMDEX convention Microsoft did intensive marketing of Windows, although the product was far from being complete. MacGregor's team had developed a new demonstration program that could display Multiplan, Word and Chart running at the same time. Then due to a lack of IBM support for Windows, Microsoft stated that it would retail the program for less than $100 and promised to release the software in April 1984. However, they had completely underestimated the magnitude of the programming effort required. This resulted in the release date being changed to the fall. By June, Microsoft had firmly committed itself to establishing Windows as a standard graphics user interface. However, IBM was still not supporting Windows and announced their character-based interface called

TopView in August. A related event in August, was Microsoft's release of DOS Version 3 for the IBM PC AT computer. That same month, a company reorganization resulted in MacGregor reporting to Steve Ballmer instead of Bill Gates.

Gates wanted the Windows program to be more like the Macintosh. This resulted in Neil Konzen who had worked on application programs for the Macintosh, being assigned to the Windows team in August. Gates and Konzen were very critical of the Windows software. The result was a redesign of the Windows software to make it more like the Macintosh. This was also intended to simplify the adaptation of Microsoft's application software to either the IBM Personal Computer or the Macintosh. A number of Macintosh features were added such as: calendar, clock, control panel, games and an elementary word processor. Another late change requested by Gates was keyboard equivalents for all mouse operations. Other potential problems were the use of a less intuitive tiled window display and compatibility problems with DOS. The redesign and increase in program size resulted in a new target release date of June 1985. The delays and conflicts with Ballmer resulted in Scott MacGregor leaving Microsoft in the spring of 1985.

In May, Microsoft demonstrated an advanced version of Windows at COMDEX. In June, they released a test version of Windows to software developers and computer manufacturers. Finally in November 1985, at the fall COMDEX show, Microsoft released Windows Version 1.03 as a retail package listing for $99. The release date was a significant change from the original promise of April 1984, and the probable cause for the use of the term "vaporware."

The program featured multitasking that enabled users to work with several programs at the same time, and to easily switch between them. However, the program operated in real mode, not the safer protected mode and had a maximum memory limitation of one megabyte. Microsoft received mixed reviews due to its slow speed, the windows could not overlap and lack of application programs utilizing windows technology. The issue of slow speed was related to the users available memory. The

release package stated that a minimum of 256K was required, but 512K was recommended. However, even with the recommended memory users were not happy with the speed. It was not a successful conclusion.

Between 1986 and 1987 Microsoft assigned a lot of human resources to the joint development of the IBM operating system OS/2. This resulted in the Windows team being reduced significantly. However, it did include Rao Remala and Dave Weise. Microsoft released Version 2.01 of Windows in October 1987, with the Excel spreadsheet program. Then they released Version 2.03 of Windows and Windows 386 in January 1988. Version 2 featured overlapping windows, access to EMS memory and movable icons. Windows 386 was a Version 2 optimized for the more powerful Intel 80386 microprocessor. Version 2.1 of Windows was released in June and was renamed Windows 286. However it was still not a commercial success.

Early in the summer of 1988, Weise started to incorporate protected mode features in Windows that Murray Sargent had developed for a program debugger. Sargent was a physics professor at the University of Arizona who was working for Microsoft during the summer. Weise also utilized EMS (Expanded Memory Specification) capabilities that overcame some of the memory limitations of Windows. The program with these two significant improvements was successfully demonstrated by Weise in August. However, a related event of some concern, was the release of the Presentation Manager program by IBM in October.

The Windows team incorporated enhancements to the graphics, such as three dimensional buttons. Then during 1989 TrueType font technology was obtained from Apple Computer, in exchange for TrueImage font technology that Microsoft obtained when it acquired a company called Bauer. Gates was determined to have a successful Window product. Contributing to this momentum was an increasing number of application programs being released by other companies for Windows. Another significant factor was the availability of personal computers, with more powerful microprocessors to handle the graphics user interface. Windows would become a successful product in 1990.

12.5 ... Languages

In 1981, Microsoft developed a version of BASIC for the Epson HX-20 laptop computer. Then in the spring of 1982, Microsoft released GWBASIC (acronym for Gee Whiz BASIC), that included support for advance graphics. Microsoft also developed an IBM compatible BASIC for the Compaq portable computer in 1982.

Microsoft designed the BASIC interpreter released with the IBM PC computer on an 8-bit computer architecture. Microsoft had been getting reports that the performance of the PC BASIC was no better than the 8-bit Apple II computer. Mike Courtney programmed a new BASIC interpreter and optimized it for 16-bit computers and version 2.0 of the disk operating system. Microsoft released the new BASIC in March 1983, at the same time as PC-DOS 2.0 for the IBM PC/XT computer.

Microsoft released COBOL and FORTRAN for MS-DOS in March 1982. Then they released the programming languages C and Pascal for MS-DOS in April 1983.

In late 1983, Microsoft quickly developed a Macintosh version of BASIC to compete with the Apple MacBASIC that was having delays in completion. Microsoft released the BASIC interpreter for the Macintosh at the same time as the Macintosh computer in January 1984.

Microsoft released QuickBASIC in mid 1986, with a structure and programming environment similar to Borland's Turbo Pascal. Microsoft subsequently released an improved version of QuickBASIC to compete with Borland's Turbo BASIC.

Microsoft released Quick Pascal in March 1989, to compete with Borland's Turbo Pascal. Then they developed Quick C to compete with Borland's Turbo C.

Languages became less significant to Microsoft as the 1980's progressed. Users were not programming. Application programs, operating systems and the Windows graphic user interface had become the dominant consumer software.

12.6 ... Application Programs

Microsoft hired a consultant Paul Heckel, who had been at Xerox PARC, to evaluate the requirements for a new spreadsheet in May 1980. Heckel suggested that Microsoft develop a spreadsheet similar to VisiCalc with menus and an improved user interface. In late 1980, Microsoft assigned programmer Mark Mathews to develop the software. The spreadsheet program became known as Electronic Paper.

Then in November 1980 Charles Simonyi made his initial contacts with Microsoft. As a Hungarian teenager Simonyi had developed his programming skills on a Russian Ural II vacuum tube computer. After working in Denmark and studying at Berkeley in California, he started working for Xerox PARC (Palo Alto Research Center). Simonyi co-developed an innovative word processing program called Bravo for the Alto computer. In November, Simonyi submitted a far reaching plan for application software development to Gates and Steve Ballmer. The proposal included plans to use the latest graphical concepts pioneered by Xerox in new word processors, spreadsheets, databases and other programs. In February 1981, Microsoft appointed Simonyi director of applications development at Microsoft.

One of his early concepts was for the development of core software with a consistent graphical user interface for each application program. The core software facilitated the development of programs for different computer platforms. The graphical interface became known as the Multi-Tool Interface and utilized mouse control.

Another concept developed by Simonyi became known as "Hungarian" notation. This concept applied a naming convention to variables, functions and macros. Simonyi has stated that its use will "improve the precision and speed of thinking and communicating." The Hungarian notation convention simplifies the reading of source code by other developers. Microsoft uses it primarily in the development of application software.

Spreadsheets

Multiplan

After Simonyi's arrival at Microsoft in 1981, he modified the spreadsheet program Electronic Paper, to incorporate the core software concept, the Multi-Tool Interface, windows and other improvements. Principal programmers for the software were Doug Klunder, Bob Mathews and Dave Moore. Microsoft renamed the program Multiplan, then released it for the Apple II and Osborne computers in August 1982, and for the IBM PC in October. Multiplan had unique features. Some of those were: Windows that enabled display of separate areas of the spreadsheet, menus, named cells, help screens and automatic recalculation. However initially the program was slow in operation. This was quite obvious when compared to Lotus 1-2-3 released in November 1982. Contributing to the poor performance was an IBM requirement that the program operate on a PC with only 64K bytes of memory. However Microsoft could readily adapt the software adapted to many different computers, that resulted in significant sales of the program.

Microsoft released an enhanced update, Version 1.1 in February 1984. An increase in the memory requirements improved the performance. It was also available for numerous computer platforms and other languages including Japanese. Microsoft then adapted the program for the Apple Macintosh computer and announced it in August 1984. However, Neil Konzen had to rewrite the program due to a number of problems. Multiplan had difficulties competing with Lotus 1-2-3 in North America. However it had highly successful sales overseas.

Microsoft released Version 2.0 of Multiplan for the PC computer in October 1985. Then they released a faster Version 3.0 in January 1987.

Excel

During 1983, Lotus 1-2-3 had replaced VisiCalc and Multiplan as the dominant spreadsheet program. Microsoft felt that improvements to Multiplan would not be enough to compete with Lotus 1-2-3. Microsoft

required a new innovative product. After extensive review of competing products, Jabe Blumenthal who had worked in marketing, Doug Klunder and others defined the design of a new spreadsheet with advanced capabilities. Microsoft assigned Klunder, who had worked on Multiplan to develop the software. The project now had the code name of Odyssey and a completion target of mid 1984.

In early 1984, Lotus Development Corporation was concentrating their efforts for the Apple Macintosh, on a new integrated program called Jazz. Lotus 1-2-3 was also in a very dominant position in the IBM PC market. Gates therefore decided in March, to change the initial introduction of Odyssey, from the IBM PC to the Macintosh computer with 512K bytes of memory. This change in computer platforms resulted in a delay. Microsoft now targeted the program for completion in nine months. At the end of the nine months Klunder left Microsoft for a short period. Philip Florence who had come from Wang Laboratories, replaced him.

During 1984, Microsoft considered a number of different names for the advanced Odyssey spreadsheet project. Then Microsoft selected the name Excel that a branch manager had submitted. Microsoft announced Excel for the Macintosh in May 1985, but it was not available for release until September at a price of $395. The program was highly successful and reported to be even better than Lotus 1-2-3 on a PC computer. Microsoft released Version 1.5 of Excel in May 1988 and Version 2.2 in May 1989.

Microsoft started work on Excel for Windows on an IBM Personal Computer after the Macintosh release. The software design had a separate layer of code that isolated the program from the Macintosh and DOS/Windows operating system. This facilitated the adaptation of the software for Windows. Jeff Harbers was a principal in the new software development. The program incorporated capabilities for Lotus 1-2-3 file interchange and use on the OS/2 operating system. Microsoft released Windows Excel in October 1987. This release also included Version 2.01 of Microsoft Windows and featured overlapping windows and movable icons. In October of

1989, Microsoft released Excel for Presentation Manager and the OS/2 operating system.

Word Processors

Word

Development of a word processor started in mid 1982. Simonyi and Richard Brodie who had worked with Simonyi at Xerox PARC developed the program. The program initially had the name Multi-Tool Word.

The word processor utilized advance graphical concepts similar to the Xerox Bravo program and mouse control for selection, changing and deletion of text. The program incorporated the concept of "What-You-See-Is-What-You-Get" (WYSIWYG). It was the first word processing program to display boldface, italics, underlining, sub and superscripts. It also featured multiple windows, ability to work on multiple documents, temporary storage of deleted text and style sheets for automatic formatting of a document. Microsoft also incorporated the capability to use laser printers.

Microsoft introduced Multi-Tool Word in the spring of 1983. Then in the summer, Microsoft reoriented its product naming policy to emphasize the company name. This resulted in the word processor being renamed Microsoft Word. Microsoft introduced the word processor in September. Microsoft Word had a price of $475 with a mouse, or $375 without. Microsoft provided free demonstration copies of the program to subscribers of the *PC World* magazine in the November 1983 issue.

The program received mixed reviews and initial sales were below expectations. Microsoft released improvements to the program during 1984, and Version 2.0 that included a spelling checker and word counter in February 1985. Then Microsoft released Version 3.0, that included a sophisticated on-line tutorial in April 1986 and Version 4.0 in November 1987. The new versions improved the popularity of the program and the market share.

Macintosh Word

Microsoft released Version 1.0 of Macintosh Word in January 1985 and a revised version in June. The company then announced major improvements to Macintosh Word in October 1986 that they incorporated into Version 3.0 (Microsoft did not release a Version 2) released in February 1987. However the program had a number of problems that resulted in a free upgrade. Microsoft released Version 4.0 in March 1989.

Word for Windows

The company initially developed Word for Windows under the code name of Cashmere. Richard Brodie was a principal in the early development of the software. However, Brodie left Microsoft and the project name changed to Opus in 1986. After many delays, Microsoft released Version 1.0 in December 1989. However it had a number of problems that resulted in improvements being incorporated in a subsequent release.

At the end of the 1980's the two leading word processor programs were WordPerfect and the different versions of Microsoft Word. WordPerfect was in the number one position. However with the Macintosh application included, Microsoft Word was closing the gap.

Databases

Omega is the code name of a database project started in the early 1980's for use with Windows. However the project had problems and Microsoft terminated the development in 1990. Following the termination of Omega, the company started a new entry level database project with the code name of Cirrus.

Integrated Packages

Works for the Macintosh

The initial development was a program called Mouseworks for the Macintosh computer by Don Williams who had worked for Apple Computer. The program included a word processor, spreadsheet, database and

communications module. Microsoft obtained the rights to market the program and it in September 1986.

Works for the PC

Development of Works for the PC computer began in late 1985. It was to be an easy-to-use integrated program for the low-end of the IBM Personal Computer market. The program integrated a word processor, spreadsheet, database and a communications module. Richard Weiland was a principal in the programming. Microsoft changed the software, from an initial Windows design, to text mode with a "Windows look" due to performance considerations. Microsoft then decided to incorporate a tutorial with the program in June 1986. Barry Linnett headed the tutorial development. Microsoft released Works for the IBM Personal Computer in March 1988. It was a highly successful product.

Other Programs

Microsoft introduced Project for Windows that facilitated the planning and management of projects in May 1984. The Project program incorporated capabilities for critical path planning, cost analysis and scheduling. Then Microsoft released Microsoft Chart for the IBM PC and Macintosh in August.

PowerPoint is a presentation graphics program that Microsoft obtained when it acquired Forethought, Inc., in July 1987. The program can create overheads, slides and on-line presentations.

Mail is an e-mail program that originated from two products acquired by Microsoft called MacMail and PCMail. Publisher is a desktop publishing program introduced in 1988.

Microsoft released MS-Net with MS-DOS Version 3.1 in March 1985. This provided user network access to a shared hard disk and files. Then after difficulties with a joint development agreement with 3Com Corporation, Microsoft announced LAN Manager for networked OS/2 systems in October 1989.

Multimedia

Microsoft established a CD-ROM division in 1985. The division then started development of an encyclopedia CD-ROM disk. Microsoft based the text on the *Funk and Wagnalls Encyclopedia*. However the project would have many delays.

The division then released its first CD-ROM multimedia disk that included graphics and sound, called Bookshelf in September 1987. The disk now contains a collection of reference works. It includes *The American Heritage Dictionary*, *The Original Roget's Thesaurus*, *The Columbia Dictionary of Quotations*, *The Concise Columbia Encyclopedia*, *Hammond Intermediate World Atlas*, *The People's Chronology* and *The World Almanac and Book of Facts*.

Then in mid 1988, work started on the development of a new technical standard called Multimedia PC (MPC) for CD-ROM disks. A consortium of companies supported the standard. They include AT&T, NEC, Olivetti, Philips, Tandy and Zenith.