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History of Computing

The GUI and
the rise of Microsoft

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Early History of the GUI

First real-time graphic display systems for computers are developed for the SAGE Project and Ivan Sutherland's Sketchpad system.

Doug Engelbart's Augmentation of Human Intellect project at SRI in the 1960s developed the On-Line System, which incorporated a mouse-driven cursor and multiple windows.
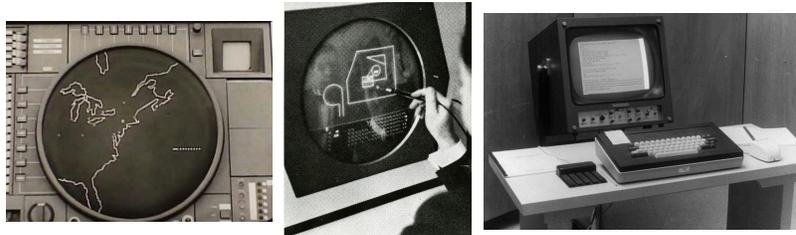
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Xerox PARC

Xerox PARC (Palo Alto Research Center) was the birthplace of many foundations of modern computing
- the mouse
- the laser printer
- the Smalltalk programming language
- Interpress (a precursor to PostScript)
- the Ethernet

Xerox PARC invents prototype of the world's first personal computer: the Alto
- the first WYSIWYG editor, first commercial use of a mouse, graphical user interface, bit-mapped display

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Mouse

The mouse was invented by Douglas Engelbart of Stanford Research Institute in 1963 after extensive usability testing.

He received a patent in Nov. 1970 for a "X-Y Position Indicator For A Display System".

One-Handed, Chord Keyset:

Code for "a"

Engelbart

He developed a *chord keyset* that would allow entry of all characters using just five keys.

A later variation, invented in the early 1970s by Bill English at Xerox PARC, replaced the external wheels with a single ball which could rotate in any direction.
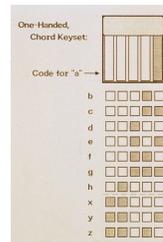
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"The Mother of All Demos"
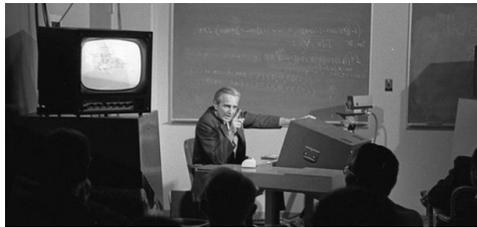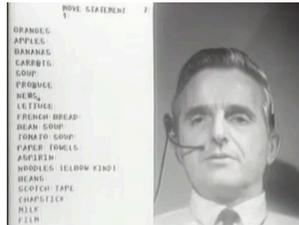
December 9, 1968
Fall Joint Computer Conference
San Francisco, CA

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Laser Printer

In 1938, Chester Carlson invented a dry printing process called xerography, commonly called a Xerox, the foundation technology for laser printers to come.

The original laser printer called EARS was developed at the Xerox Palo Alto Research Center beginning in 1969 and completed in November, 1971.

Xerox Engineer, Gary Starkweather adapted Xerox copier technology adding a laser beam to it to come up with the laser printer.

Starkweather

The Xerox 9700, the first xerographic laser printer product, was released in 1977.

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Ethernet

Ethernet was original developed as one of the many pioneering projects at Xerox PARC.

Invented between 1973-1976 by Robert Metcalfe and David Boggs

Metcalfe left Xerox in 1979 to promote the use of personal computers and local area networks (LANs), forming 3Com.

Metcalfe

He successfully convinced DEC, Intel, and Xerox to work together to promote Ethernet as a standard, which was first published in 1980.

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Steve Jobs visits Xerox PARC

Dramatization (*Pirates of Silicon Valley*)

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Early History of the GUI (cont'd)

At Xerox PARC, a research team codified the WIMP (windows, icons, menus and pointing device) paradigm, which eventually appeared commercially in the Xerox 8010 ('Star') system in 1981.

Beginning in 1979, the Lisa and Macintosh teams at Apple Computer continued to develop such ideas.

Xerox Star

Apple Lisa

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Apple Macintosh

Steve Jobs and a number of Apple engineers visited Xerox PARC by invitation in 1979.

Introduced in 1984 at a price of $2495

Featured operation entirely by GUI

Apple's policy was to thwart the design of clones

Original Apple Macintosh 128K

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Introduction of the Macintosh

Superbowl Ad (1984)

Steve Jobs
Macintosh Launch

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Apple Macintosh GUI

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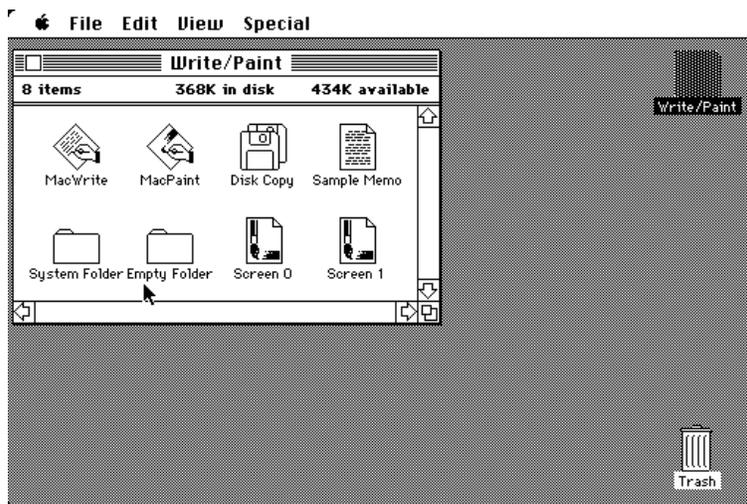
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Microsoft Begins its Rise

Microsoft uses its income from sales of MS-DOS for PC clones to invest in new software projects in the early 1980s.

new versions of Microsoft BASIC
Multiplan, later Excel
Word
Windows
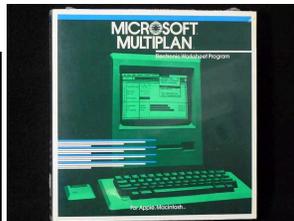
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Microsoft Helps Apple?

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The Birth of MS Windows
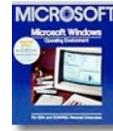
Microsoft announced its development of Windows for its own operating system MS-DOS in 1983.

Microsoft modeled the GUI after that of Apple's MacOS.

Bill Gates had been shown a Macintosh prototype by Steve Jobs early in its development (around 1981)

Microsoft was partnered by Apple to create some of the important early Mac software, such as Word and Excel.

The first independent version of Microsoft Windows, version 1.0, was released in 1985.
Apple grows concerned.

Apple licenses the use of Apple GUI features in Windows 1.0 *and all future Microsoft programs*. (Uh oh…)

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Microsoft Windows 1.0
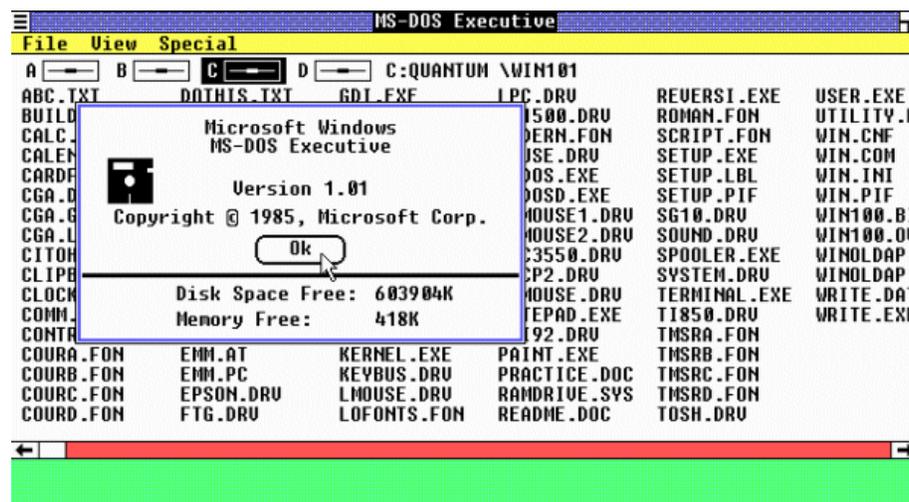
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Jobs Leaves Apple
Despite Finding Its Killer App

LARRY TESLER
Former Xerox PARC Researcher
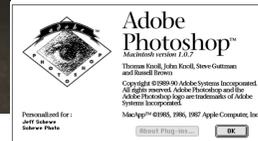
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Microsoft Windows 2.0

Microsoft Windows version 2 came out in 1987.

Much of the popularity for Windows 2.0 came by way of its inclusion as a "run-time version" with Microsoft's new graphical applications, Excel and Word for Windows.

The Apple v. Microsoft copyright infringement lawsuit was filed in 1988, highlighting the copying of many GUI elements

Apple loses in 1989: 179 of 189 contested visual displays were covered by the existing license. The others were not copyrightable (they were considered "ideas").

Reaches the U.S. Supreme Court in 1995. No luck.

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Microsoft Windows 2.0

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Apple sues Microsoft

LARRY TESLER
Former Xerox PARC Researcher
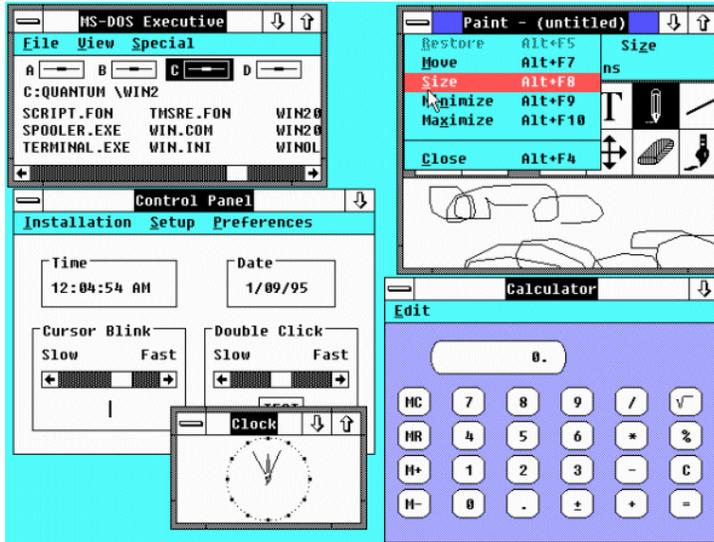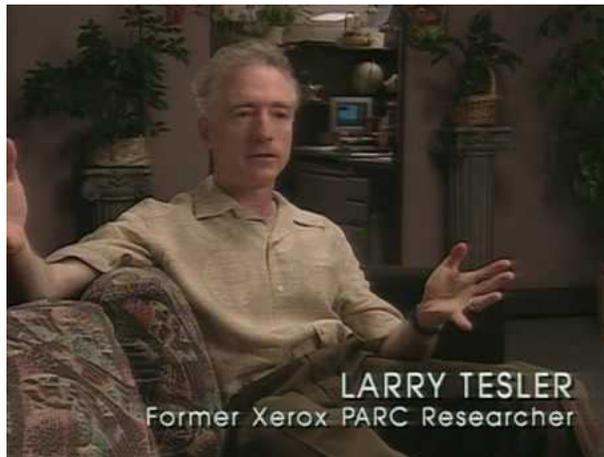
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IBM & Microsoft: OS/2

During the mid to late 1980s, Microsoft and IBM had co-operatively been developing OS/2 as a successor to DOS

OS/2 1.0, released in 1987, supported swapping and multitasking and allowed running of DOS executables.

A GUI, called the Presentation Manager (PM), was available with OS/2 version 1.1, released in 1988.

By the early 1990s, tensions developed in the Microsoft/IBM relationship.

This agreement soon however fell apart, and the Microsoft/IBM relationship was terminated. IBM continued to develop OS/2, while Microsoft developed its operating system into Windows NT

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OS/2 1.1 & 2.0
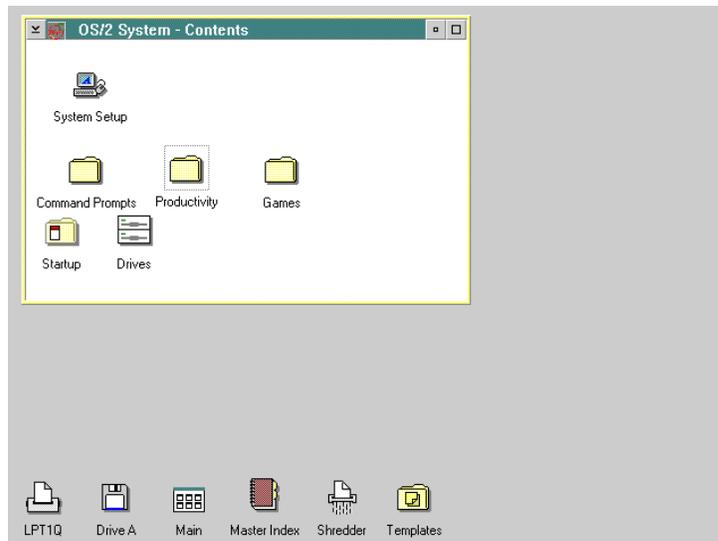
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OS/2 1.1 & 2.0
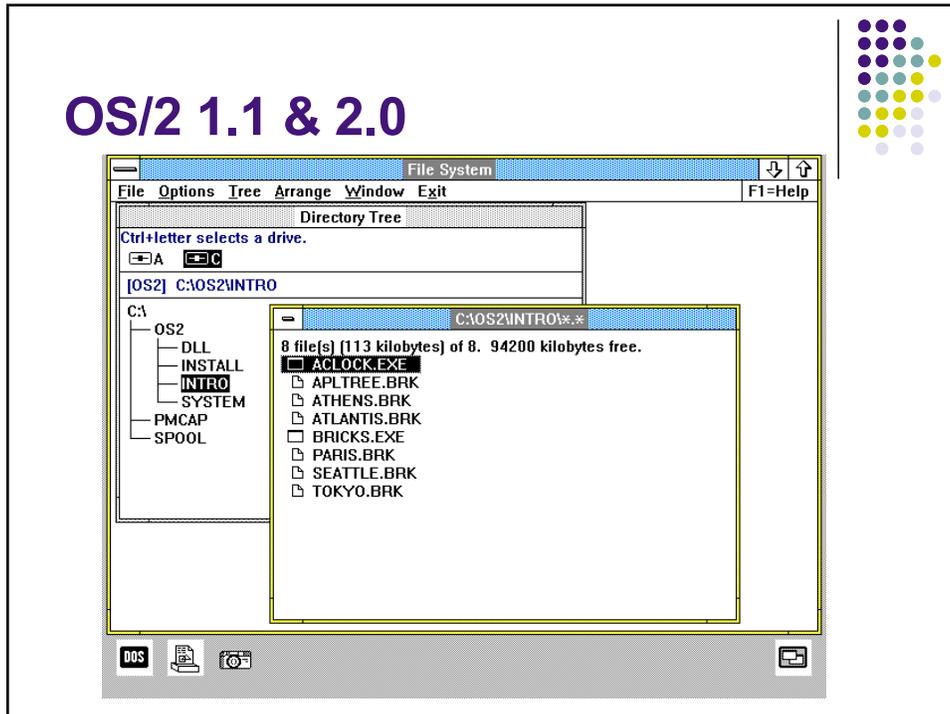
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Microsoft Windows 3.1 & NT


Windows 3.1 was released in 1992
- basic multimedia support for audio input and output
- a CD audio player application
- a TrueType font system for desktop publishing
- Built on top of DOS

Windows for Workgroups, an extended version of Windows 3.11 included file sharing support

Microsoft renamed their OS/2 version to MS Windows NT, changing the main API to a 32-bit version of its MS Win16 API.
- Independent of DOS

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Microsoft Windows 3.1

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Microsoft Windows NT

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Microsoft Windows NT

"Blue Screen of Death" - very common when things went wrong in NT

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Microsoft Windows 95

Microsoft began to develop a new version of the operating system (code name: Chicago).
Released in August 1995 in a world-wide party-event.

First Microsoft OS not to run on top of DOS

IBM continued to market OS/2, producing later versions in OS/2 3.0 and 4.0 (OS/2 Warp).

OS/2 ran Windows 3.1 programs

IBM did not have access to Windows 95 source code so compatibility became more difficult

Microsoft is accused of unfair business practices by the Dept of Justice and a number of states in 1997. (more about this soon)

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OS/2 Warp vs. Windows 95

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Microsoft Windows 95

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Additional Windows Releases

1998	Windows 98
2000	Windows ME
1993	Windows NT 3.1
1995	Windows NT 3.51
1996	Windows NT 4.0
2000	Windows 2000 (Version 5.0)
2001	Windows XP (Version 5.1)
2003	Windows Server 2003 (Version 5.2)
2007	Windows Vista
2009	Windows 7
2012	Windows 8 (tablet-based GUI)
2015	Windows 10
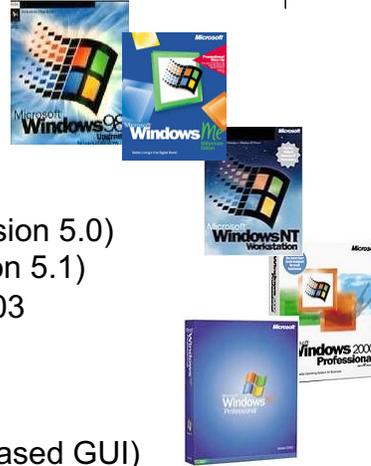
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Microsoft's Growth

The early Microsoft team from Albuquerque, NM (~1977).

The Microsoft campus in Redmond with Bellevue in the background. (2003 - Seattle Times)
Total employees: ~135,000 (as of 2018)

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