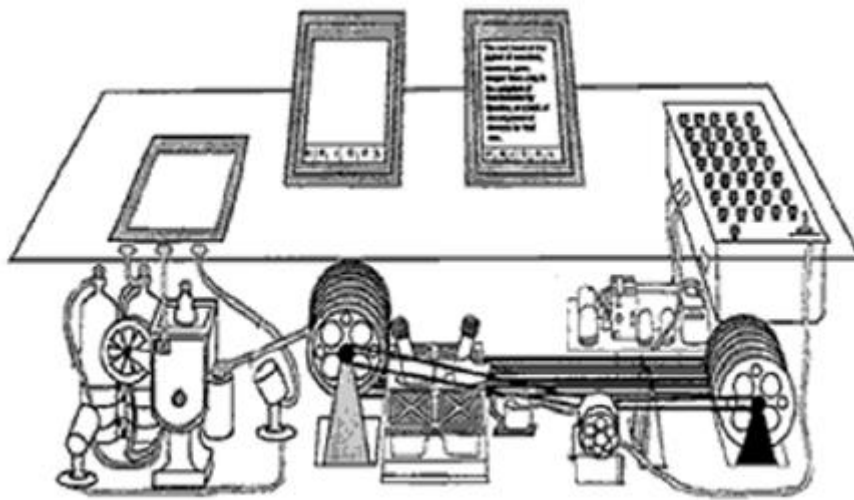


1. Historical evolution of graphical user interfaces

1.1. background

In the early thirties, Vannevar Bush (Roosevelt's scientific advisor) described a device called Memex, which he visualized as a table with two graphic screens, a keyboard and a scanner.

Memex



Font: <http://memexsim.sourceforge.net/>

In 1968, Englebart managed to make a public demonstration of his project in front of a thousand professionals. His team consists of the following:

- A vector graphics based **display**, which can display text (uppercase only) and solid lines.
- A standard **keyboard**.
- A **keyboard of 5 keys** (which, combined, produce all the letters of the alphabet).
- A small box with three buttons: the first **mouse** in history.

Teclat i ratolí del projecte d'Englebart



Font: <http://arstechnica.com/articles/paedia/gui.ars/2>

The demo included hyperlinks, full-screen document editing, context-sensitive help, networking, e-mail, instant messaging, and video conferencing. The interface consisted of several windows.

Englebart's team left its activity in 1969 and went to work for a company until then dedicated to paper printing: Xerox, which founded the Palo Alto Research Center (PARC) in 1970.

In 1973, PARC presented the first computer with a graphical interface: the Alto, with a screen resolution of 606×808 pixels. Each pixel can be lit independently, which expands the graphical possibilities. It has no windows. It includes a mouse with three buttons, and an on-screen cursor with the same appearance as the current one (diagonal arrow pointer), and modal.

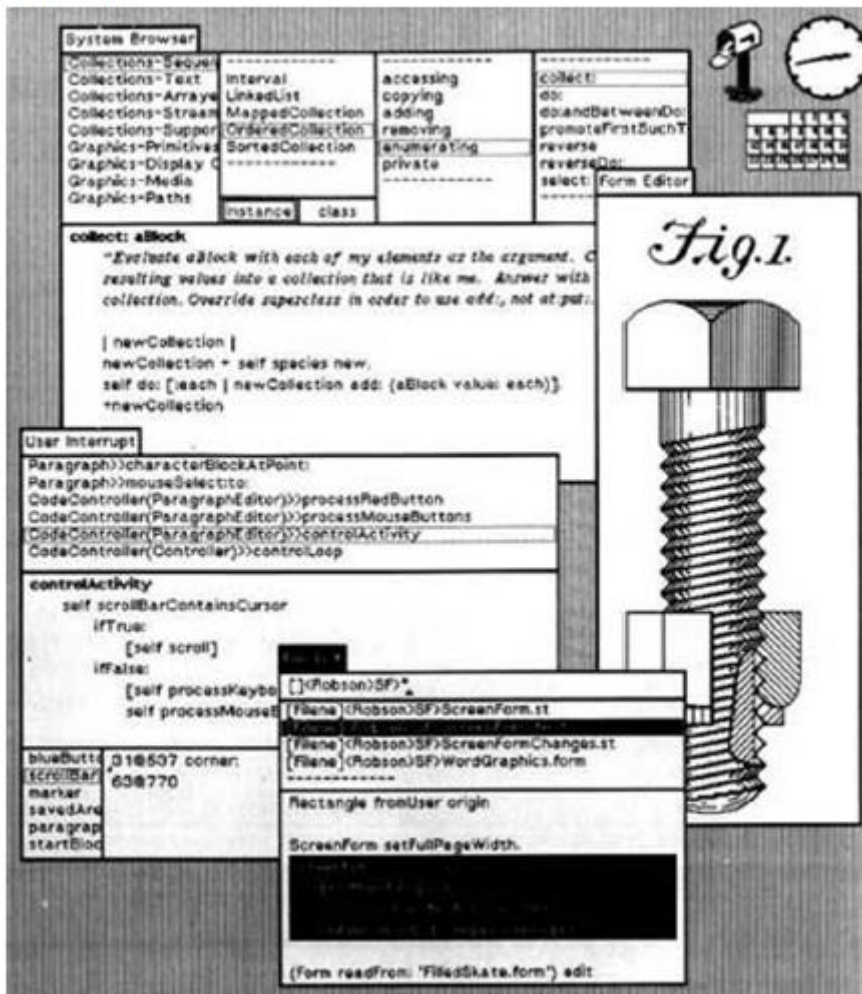
Alt



Font: <http://arstechnica.com/articles/paedia/gui.ars/3>

To provide consistency to applications, PARC develops in 1974 the first GUI (graphical user interface): Smalltalk. It features individual windows, each of which can be scrolled around the screen from the title bar. Smalltalk is the first interface to include icons, scroll bars, radial buttons, and dialog boxes.

Smalltalk

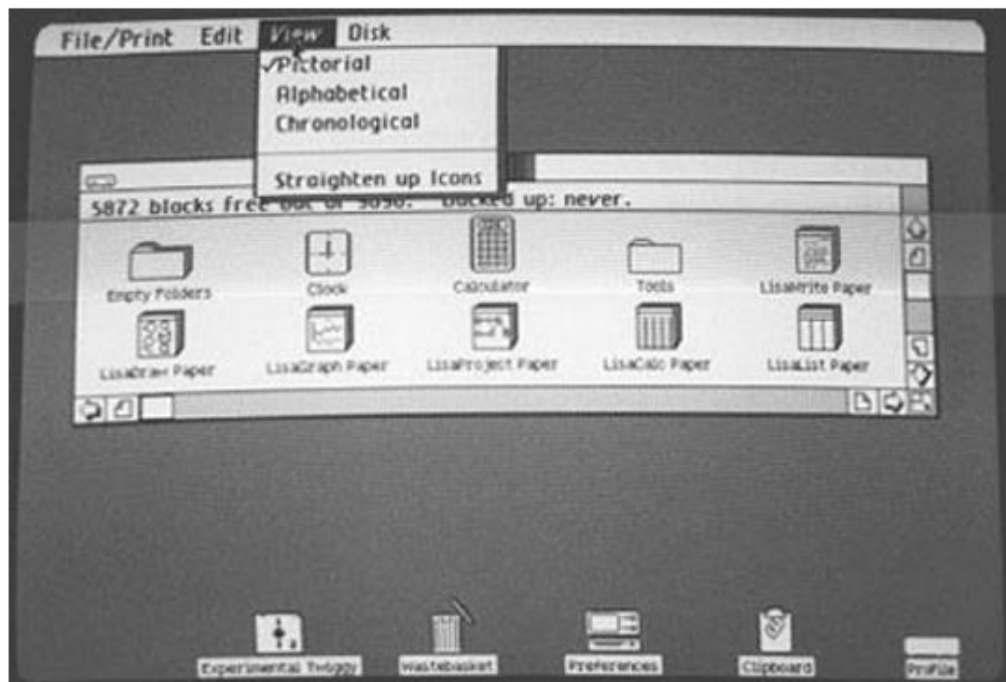


Font: <http://arstechnica.com/articles/paedia/gui.ars/3>

Some of Xerox's engineers landed in other companies, including Apple Computer, founded in 1976 by Steve Jobs and Steve Wozniak, which led to the Lisa computer in 1983. The **Lisa** includes:

- An iconic interface where each icon indicates a document or an application,
- A drop-down menu bar,
- Signals to indicate the menu item that is selected,
- Keyboard shortcuts,
- A trash can to delete files,
- A two-button mouse that would later be simplified into a single button,
- The double-click action to select/run an application.

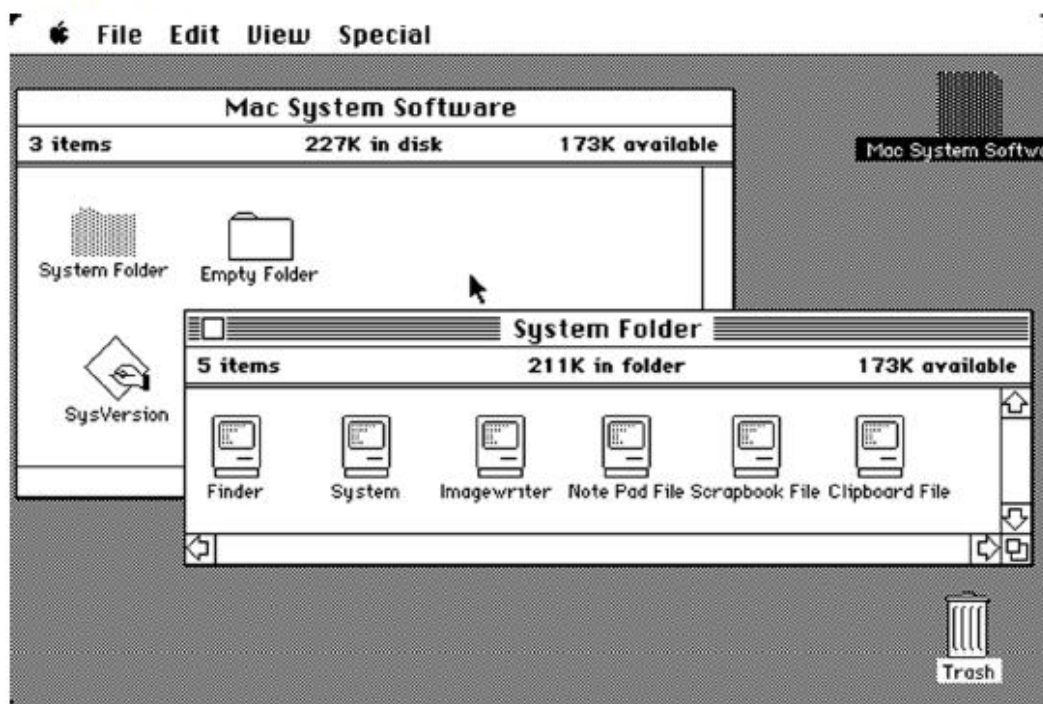
Lisa



Font: <http://arstechnica.com/articles/paedia/gui.ars/4>

The **Macintosh**, or non-multitasking computer with monochrome screen (512 by 384 pixels), and 128 kb memory.

Macintosh

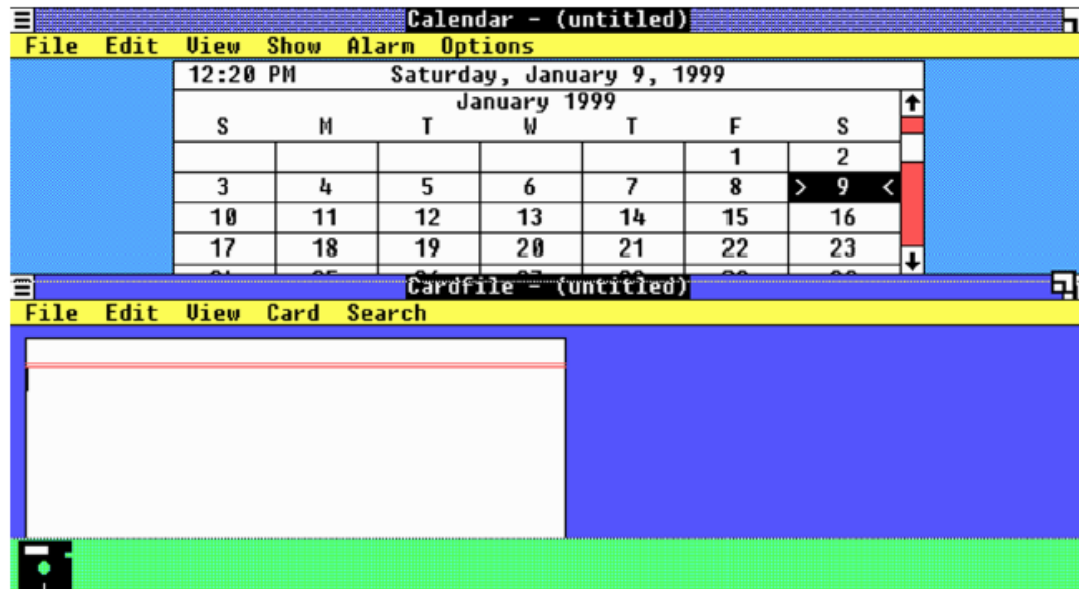


Font: <http://arstechnica.com/articles/paedia/gui.ars/4>

In 1983 Bill Gates announces Interface Manager, later simplified as **Windows 1.0**, which appears in 1985. It features:

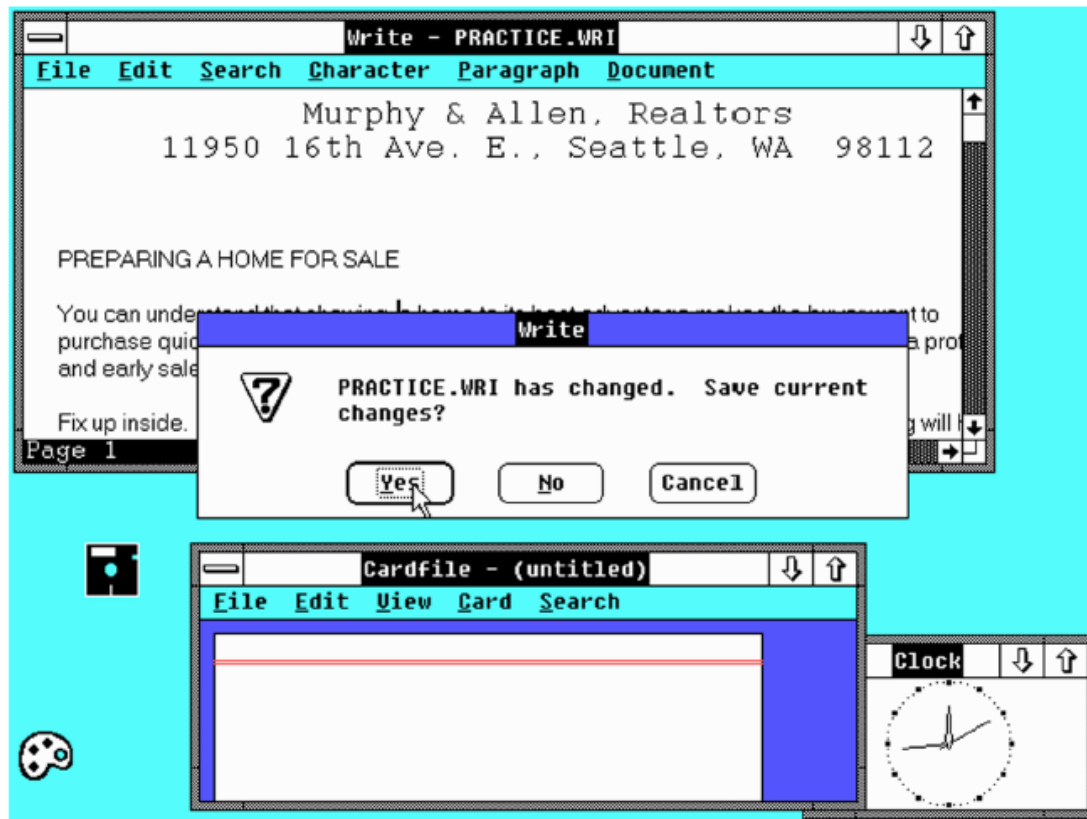
- Color interface.
- All GUI standards: scrollbars, window controls, menus, general menu bar.
- Mosaic windows (not overlapping).

Windows 1.0



Font: <http://arstechnica.com/articles/paedia/gui.ars/5>

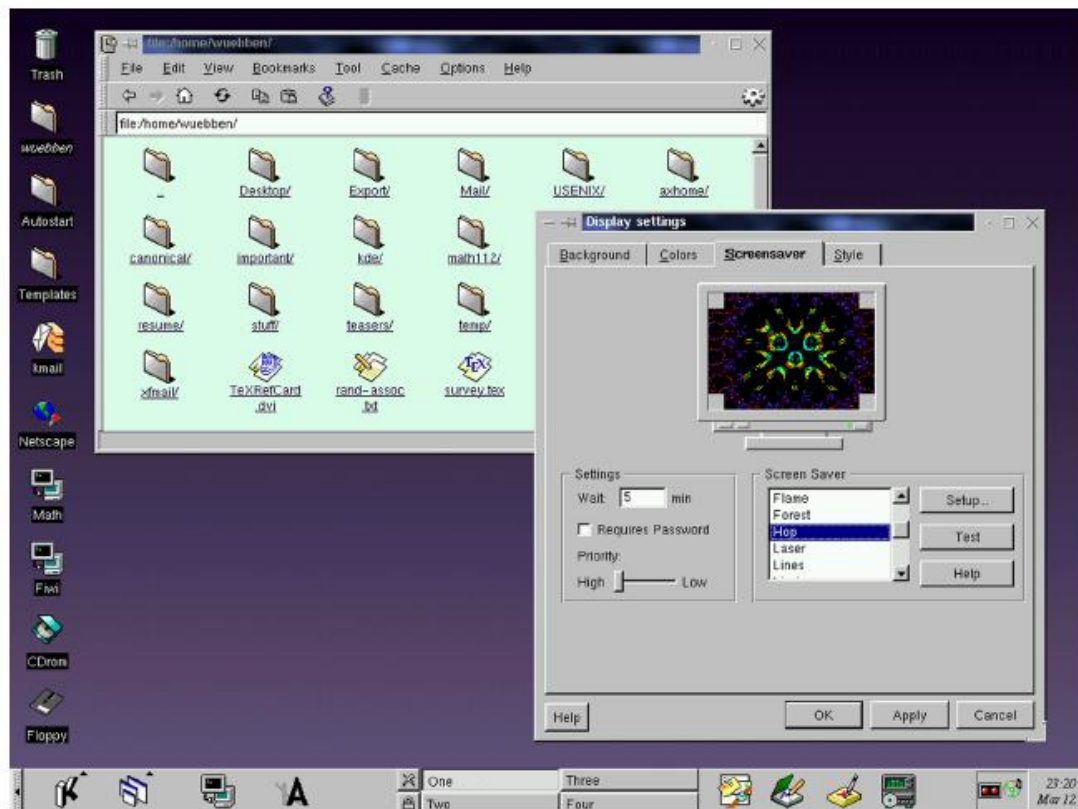
Windows 2.0



Font: <http://arstechnica.com/articles/paedia/gui.ars/6>

At the end of the 1980s, new Unix-based GUIs appeared, based on an architecture called X (from MIT) which formed the basis of later Linux.

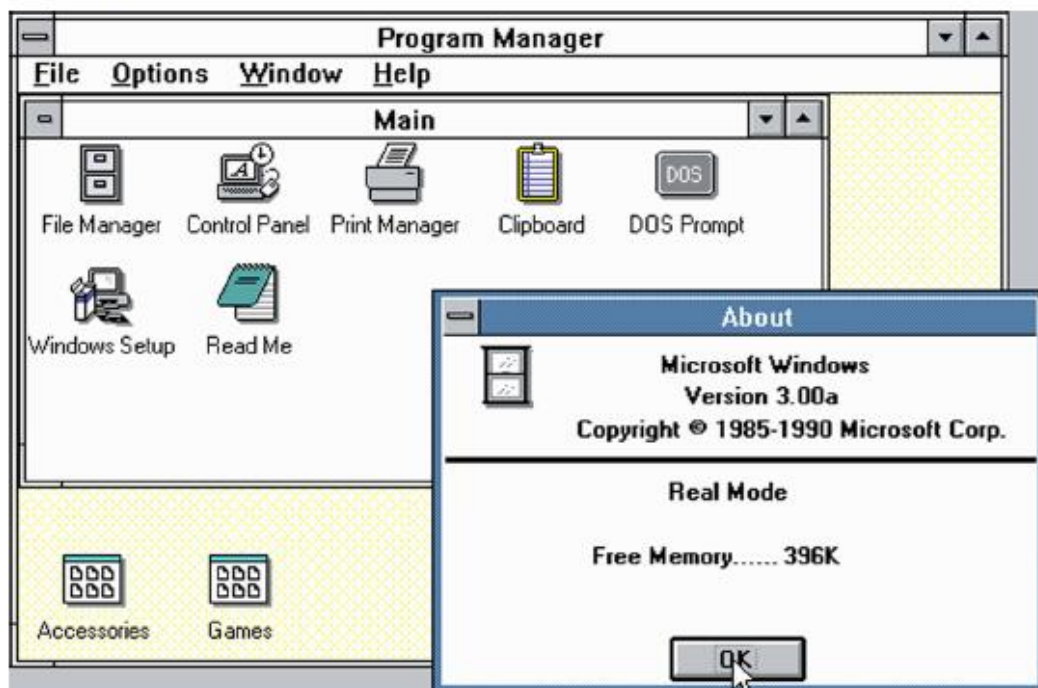
Unix



Font: <http://arstechnica.com/articles/paedia/gui.ars/6>

Windows 3.0 appeared in 1990, and version 3.1 in 1992.

Windows 3.0



Font: <http://arstechnica.com/articles/paedia/gui.ars/7>

In Windows 95 the "start menu" and the task bar are introduced for the first time.

Windows 95



Font: <http://arstechnica.com/articles/paedia/qui.ars/7>

In 2001 Apple presents the Aqua interface for its Mac OS X, developed in collaboration with NeXT.

Aqua



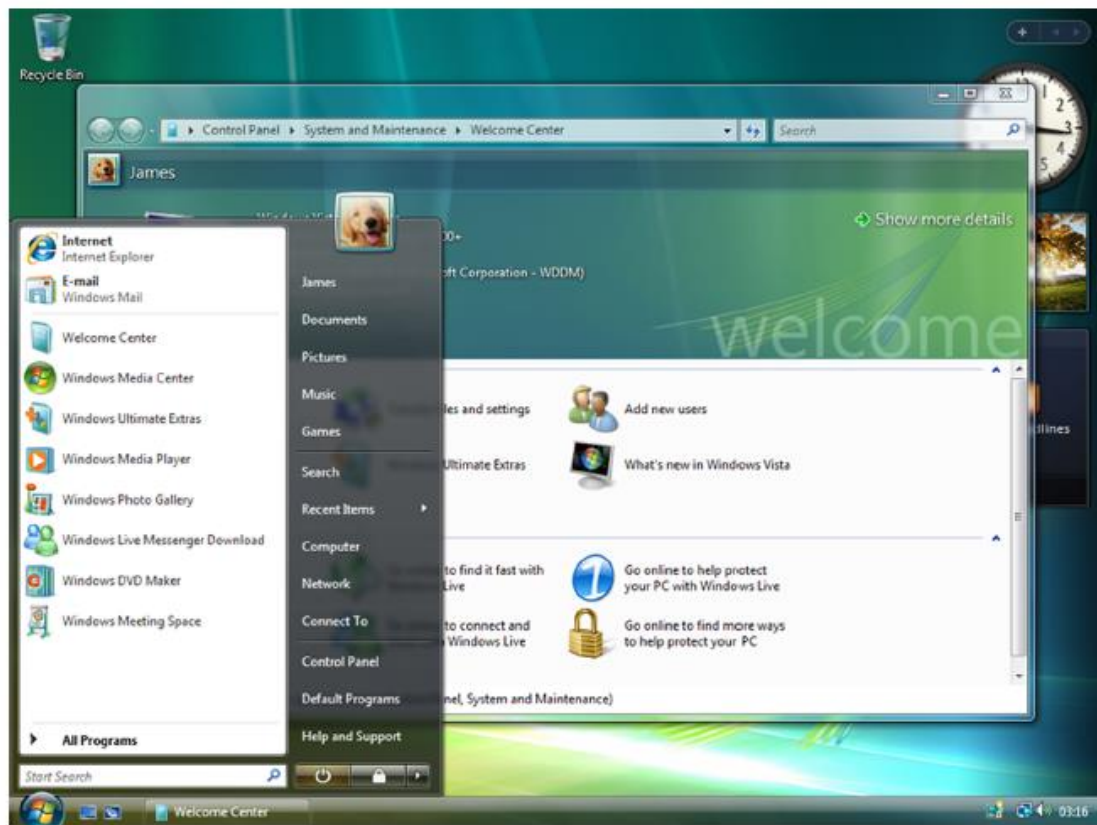
Font: <http://arstechnica.com/articles/paedia/gui.ars/7>

Leopard. Versió de Mac OS X vigent el 2007



Font: <http://www.apple.com/macosx/features/spotlight/>

Windows Vista



Font: http://en.wikipedia.org/wiki/windows_vista

1.2. Evolution of hypertext

In 1965, Ted Nelson (director of rock movies and musicals) introduced the concept of hypertext by devising Xanadú, a data connection system that overcomes the limitations of paper.

The structure of Xanadú is based on **hyperlinks**, or a hypertext structure in which the connections are always maintained even if the documents change, and which allows non-linear readings, in which the user decides which course he wants to take.

A projection of hypertext is hypermedia, in which links are made between documents of different nature (video, audio, etc.), exploiting all human sensory capacities.

The Xanadú project represented the conceptual basis of the World Wide Web and other systems such as Lotus Notes or HyperCard.

1.2.1. Hypertext and the WWW

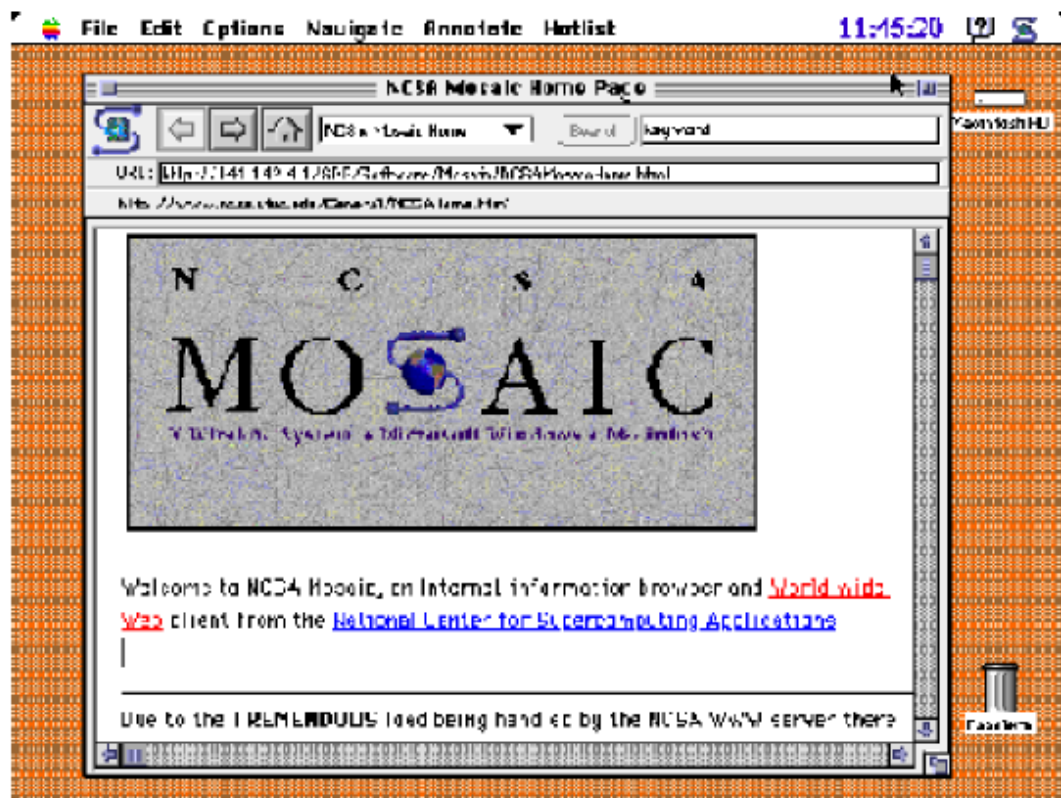
In 1989, Internet connection protocols were standardized using TCP/IP. Tim Berners Lee, an engineer at CERN, proposes a hypertext system to structure information on the Internet, so that it is more usable by scientists.

In 1990, he creates a viewer that constitutes the birth of the **WorldWide Web**, with interconnected links (until then it was not possible to access from one computer to another through links, nor were there search engines, nor could images be integrated), which it is standardized in 1993 as **hypertextmarkup language** (HTML).

In 1991, a 22-year-old student at the University of Illinois named **Marc Andreessen** – who would later be the founder of Netscape – created the Mosaic graphic browser. Mosaic allows:

- The Internet can be explored with simple mouse clicks (previous browsers were in text mode and used with the keyboard),
- The incorporation of images together with the text.

Mosaic



Font: <http://www.ncsa.uiuc.edu/news/access/archive/backissues/93.2/mosaic.html>