An Unofficial History of Advances in Computer Interfaces

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The following is an unofficial survey of the claimed historical origins for various user interface concepts for mainframe and personal computers, notably the Macintosh computer. Essentially all of this material is copied or adapted from bboard messages posted by Oliver Steele (steele@weiss.cs.unc.edu) in March 1988.

Please note: I have no special knowledge on these issues myself. I simply collected the following information from various 1988 newsgroup discussions and put it on this web page in order to preserve it. SInce this site may not last forever, I would be delighted if any computer museum or computer history group would take over this material and make it available on a permanent basis on their site.

In the following SRI refers to the Stanford Research Institute, as it was known at that time. SRI was initially established and operated by Stanford University to do proprietary and commercially oriented research that might not have been appropriate in the University's own research labs. During the campus disruptions of the Vietnam-Cambodia era (1969-70) SRI bought itself free from Stanford and was renamed SRI International. It is famous in interface history for the pioneering early work inventing the mouse and other concepts by Douglas Engelbart in the mid 1970s.

Xeroc PARC refers the Xerox Palo Alto Research Center, the "dream lab" in the foothills behind Stanford. It's contribution to computer interface ideas is described in the book *Fumbling the Future: How Xerox Invented, Then Ignored, the First Personal Computer* by Douglas Smith and Robert Alexander. The tour of this lab that Xerox voluntarily offered to Steve Jobs in 1979 allegedly let the cat out of the bag on many of the interface ideas that were later used or modified into the Apple Lisa and Apple Macintosh in 1983 and 1984.

Keyboard-based menus
Earlier than 1978, probably quite ancient
Keyboard-based hierarchical menus
UCSD's Pascal system (1978) or earlier
Bitmapped displays
CSL@Xerox PARC, for the Alto(?). PERQ was first commercial product (or Terak Corporation, c. 1978)
BitBLT raster operations
Dan Ingalls(LRG)@Xerox PARC
Light pen as screen pointer
1960 or earlier
Joysticks
Spacewar games, 1962 or earlier
Trackballs
Some time in 1960s
Pointing device with on-screen pointer

Doug Englebart@SRI (mid 70s).

Mouse

Doug Englebart@SRI (trackball upside down?)

Cursor changes to show system mode

William Newman@Xerox PARC

Cursor changes to show context

David Tilbrook (Newswhole) (1975)

Menus

LRG@Xerox PARC (?)

Popup Menus

Ingalls(LRG)@Xerox PARC

Pulldown menus

Lisa@Apple

Menu bar

Lisa@Apple

Hierarchical menus

Paeth(SSL)@Xerox PARC (Smalltalk)

Disabling of menu items

Lisa@Apple or Ed Anson (1980 or earlier) or Xerox PARC (1982 or earlier)

Command keys for menu items

Lisa@Apple or Ed Anson (1980) or earlier

Check marks on menu items

Lisa@Apple

Overlapped windows

Ingalls(LRG)@Xerox PARC

Tiled windows

CSL@Xerox PARC

Event queues

Simula@NCC, then Lisa@Apple or Ed Anson(GPGS) - > CORE, GKS (1975)

Icons

David Smith(SDD)@Xerox (Star->Mac->Lisa)

Scroll bars

LRG@Xerox PARC

Push Buttons

LRG@Xerox PARC

Radio Buttons

Kaehler(LRG)@Xerox PARC

Check Boxes

LRG@Xerox PARC (?)

Dimming of inactive buttons

David Tilbrook (Newswhole) (1975)

Dialog Boxes

Star@Xerox PARC (property sheets)

Concept of resources

Horn(Mac)@Apple

Multiple fonts & styles in text

CSL@Xerox PARC (Bravo) or Wang word processors (1978 or earlier)

Modeless Interaction

Tesler(SSL)@Xerox PARC
Move/Copy/Delete
Xerox PARC
Cut/Copy/Paste with a mouse
Tesler(SSL)@Xerox PARC (Gypsy, Smalltalk)
Selection point between (instead of on) characters
Tesler(SSL)@Xerox PARC (Gypsy & Smalltalk). TECO had this earlier than PARC, it is claimed; also Stanford's TVEDIT running on DEC timesharing systems, Brian Tolliver, 1963

Bruce Horn also noted that, "I think it is unrealistic to attribute many of these concepts to a single person. Many folks in LRG (Learning Research Group) & SSL (Systems Science Laboratory), CSL (Computer Science Laboratory), and SDD (Systems Development Division) at Xerox PARC, and the Lisa and Mac groups at Apple were involved in creating these ideas."

Ed Anson pointed out that menus have been around longer than pointing devices, i.e., the first menus were keyboard-based menus. In the list above "Menu" without modifier means a mouse-driven one. Josh Littlefield, Peter Schachte, and Jack Campin pointed out that some systems allow the user to copy/move text in ways other than cut/copy/paste.

Also David Tilbrook described a number of unusual cursor shapes used in some systems to indicate what the system was doing, or waiting for:

Symbol & Meaning

Buddha = System not ready for input

Oy_Vey! = Invalid selection

Tracker = Used when dragging borders on page

Eh_Wot? = Puck not on tablet or button depressed redundantly

No_Room = Trying to place object without enough space

KeyBoard = Awaiting user input at keyboard

OK? = Action needs to be confirmed

Standard = Anything else
