Apple Lisa Computer
Technical Information

Apple Lisa Computer: Lisa Legacy by Larry Tesler (MacWorld Sep. 1985)

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Note Pad: Larry Tesler

The Legacy of the Lisa

A member of the Lisa development team reflects on how the Lisa changed personal computing

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On April 29 Apple announced that it would cease production of the Macintosh XL computer, formerly known as the Lisa. As a member of the group that helped create the Lisa, I couldn't help but feel a pang when I heard the news. Yet my overriding feeling is one of gratification. In its brief product cycle, the Lisa changed people's expectations of a personal computer. Among Apple products, the Lisa spawned not only the Macintosh but also the MouseText option on the Apple II (see "The Lisa's Influence"). Even IBM PC products were heavily influenced by the technology, including VisiCorp's *Visi On*, *Microsoft Windows*, Digital Research's *GEM*, Ashton Tate's *Framework*, and IBM's *TopView*.

The user interface was the most publicized characteristic of the Lisa. It introduced a host of ideas that have been widely emulated, ranging from how columns are widened in a spreadsheet to how people are notified of mistakes and problems. When the Lisa development team designed the user interface, we borrowed good ideas from wherever we could find them. For example, the Lisa borrowed pop-up menus and overlapping windows from Smalltalk, status lines from *VisiCalc*, and automatic removal of extra spaces after text deletion from Douglas Engelbart's research at SRI International.

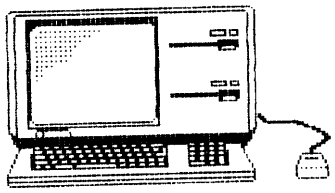
But the Lisa user interface was not a copy of any that preceded it; it was distinctive. It was the first to feature the now-familiar menu bar, the one-button mouse, the Clipboard, and the Trash can. Although the Xerox Star had icons, the Lisa was the first product to let you drag them with the mouse, open them by double-clicking, and watch them zoom into overlapping windows.

To minimize the time it would take people to learn to use the Lisa, Apple technical writers, programmers, and marketers struggled for two years to find suitable terminology to appear in menus, dialogs, alerts, and manuals. Our foreign-language translators spent months more choosing the corresponding terms in French, Italian, German, Spanish, and other languages.

It may come as a surprise that terms like *Revert*, *Plain Text*, *Align Left*, *Clipboard*, and *Panel* were difficult to coin and even more difficult to agree upon. When we studied *VisiCalc*, we discovered that people had trouble interpreting the term *General Format*, which means that a number typed into a spreadsheet cell is right justified, while text is left justified. After extensive brainstorming and testing of *LisaCalc*, we chose *Words left, numbers right*, which was self-explanatory if a bit verbose.

Much has been made of the high cost and five-year development time of the Lisa. True, the development was expensive, but it did not take five years. The first Lisa was shipped in May 1983. Five years earlier, in 1978, Apple had launched a project code-named "Lisa," but that project's goal was quite different from what the Lisa eventually became. In early 1980, after Apple's senior staff visited Xerox's Palo Alto Research Center (PARC) to see a demonstration of Smalltalk, the goal was completely redefined. Only the code name, some of the hardware components, and a few of the staff members stayed the same.

I was the PARC employee who gave Apple the Smalltalk demonstration. Impressed by the perspicacity of the visiting Apple staff members, I resolved to join their company, which I did in July 1980. Rich Page had just built the first Lisa prototype incorporating a sample 68000



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microprocessor from Motorola. Apple's small but energetic Lisa development team was debating the relative merits of one-, two-, and three-button mice. No software had been designed except a tiny prototype of *LisaWrite* written on an Apple II. Some thought had been given to the user interface, but there was no menu bar, no icons, and only one scroll bar on the left side of each window.

In the summer of 1980, a group headed by Bill Atkinson and myself defined the ground rules of the user interface. Today those rules are familiar to anyone who uses a Macintosh or a Lisa. Bill prototyped pull-down menus and a one-button mouse, along with alternatives to this scheme. I had a number of people use the prototypes to compare the relative merits of those designs.

That autumn Bruce Daniels hired most of the Software Group. Although the majority had never seen a mouse before, they plunged into the design of the operating system, the Window Manager, QuickDraw, *LisaCalc, LisaDraw, LisaGraph, LisaList,* and the Desktop Manager (Finder).

As manager of the 20-person Applications Software Group, I was pressured constantly for schedules and priorities. My associate, Peggie Stanford, tried a number of project scheduling programs, but none were satisfactory. One day, at a meeting of my staff, I described my dream scheduling system. Steve Young mentioned the concept to his wife, Debbie Willrett. She promptly quit her job at another computer company and in a few incredible weeks created the first prototype of *LisaProject*. We relied heavily on that program throughout the remainder of the development period. The marketing department was impressed by its utility and decided to make it a product.

One story that was exaggerated in books and articles was the tension between the Lisa and Macintosh teams. As in any friendly rivalry, some individuals took the competition too seriously. By and large, the teams gave each other both moral and technical support. Half the Macintosh programmers came from the Lisa group, and most of those were working on both Lisa and Macintosh tasks at the same time. We were saddened when the merger of our divisions forced the elimination of many duplicate and obsolete jobs, but most of the displaced employees found positions elsewhere in the company, and the rest discovered that Lisa developers are well-regarded in Silicon Valley.

Newspapers and magazines like to feature stars, and as a result a few members of the Lisa team received the lion's share of the publicity and credit for the product. Everyone who worked on the Lisa knows that it was a team endeavor. My most lasting memory will be of how much everybody cared about the quality of the product. Every 80-hour workweek, every canceled vacation, every hot debate, and every wrenching management decision was motivated by one common driving force: we wanted our product to be the best.

By my reckoning the Lisa engineering effort took three years from product definition and first prototype to full production. In the end we had produced the first multitasking windowing system for a personal computer. In my opinion the Lisa Office System still outclasses its IBM PC imitators more than two years after its first public demonstration.

I am sure that every former member of the Lisa Development Team is proud of our accomplishment. We put our hearts, minds, and lives into fulfilling a dream. Its role in the product line will be filled by the 512K Macintosh with a 20-megabyte hard disk and integrated applications. The Lisa manufacturing line may be closed, but the accomplishment lives on in the lower-cost, higher-performance Macintosh.

The Lisa's Influence

The Lisa affected the design of many personal computers. Listed here are Lisa innovations that were incorporated into the Macintosh.

Hardware

— Mouse design
— Imagewriter printer

User Interface

— Menu bar, pull-down menus, keyboard-activated menu commands
— Printing dialog boxes
— Appearance, structure, and operation of windows and scroll bars
— Ability to move windows and icons by dragging them with the mouse
— Windows that zoom to open and close
— Dialog and alert boxes with buttons and check boxes for selecting choices

Individual Software Packages

— QuickDraw graphics are identical on the Lisa and the Macintosh.
— *LisaProject* was converted for Macintosh to become *MacProject.*
— *LisaDraw* was converted for Macintosh to become *MacDraw.*
— *LisaTerminal, LisaWrite, LisaCalc, LisaGraph,* and *LisaList* influenced the design of Macintosh applications.
— The Lisa Desktop Manager influenced the design of the Macintosh Finder.
— The Lisa printing software heavily influenced the Macintosh printer-driver equivalent.
— Lisa Pascal is still the principal language used to develop software for the Macintosh.

Larry Tesler continues at Apple Computer as manager of a group exploring software development methodology. □