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COMPUTER COUNTRY

Look at what's happening to make computers a big part of our lives

Doug Engelbart: inventor of the Mouse

BY MARION SOFTKY

To proud owners of Lisa or Mackintosh—and to Time Magazine, which proclaimed the "Year of the Mouse"—the Mouse may be an intriguing novelty which makes it easier to track words and pictures around the computer screen and issue instructions.

To Douglas Engelbart of Atherton who invented it 20 years ago at SRI, the Mouse is just one of an arsenal of computer-related tools designed to magnify human intelligence.

Dr. Engelbart is still "puzzled" by the way the Mouse has taken off. "The Mouse didn't just happen. It was part of a whole program within a conceptual framework—a whole new set of tools," he says in his office at Tymshare in Cupertino where he is now a senior scientist.

"Augmenting human intellect" through computer technology is what Dr. Engelbart calls the dream he has pursued systematically for more than 30 years. "We wanted to find as effective a way as possible to harness minds to do what we want to do," he explains.

As a result, many of the buzzwords that dominate computer talk today can be traced to the pioneering work done by Dr. Engelbart and his group at Stanford Research Institute during the 1960s. Not only the Mouse; networks, electronic mail, word processing, teleconferencing, work stations, computer graphics, work stations, multiple windows—even the ubiquitous personal computer—were parts of the system which developed from Dr. Engelbart's dream and have since diffused throughout the computer industry.

The system, now called AUGMENT, is available through Tymshare, which bought rights to it from SRI in 1977.

The December lunch for Dr. Engelbart and his wife, Ballard, came as a surprise, as did the check that was presented to him in recognition of his career at SRI from 1957 to 1977.

The check, which reflected the royalties SRI has derived from its patent on the Mouse, was particularly welcome to the Engelbarts, who have suffered financial difficulties ever since their house burned down seven years ago. For the Engelbarts, who have four children, now grown, those seven years have been shadowed by the ordeal of rebuilding their home, which is still not finished.

"It was 28 months before we moved into one end of the house," Dr. Engelbart recalls grimly. "During that time we lived in 13 temporary places."

FOLLOWING THE DREAM

It was during December 1950 when Dr. Engelbart first had his dream of how the then-recent invention of the computer could be harnessed to augment human intellect and creativity.

The next year he left his job at Ames, got married, and went to the University of California at Berkeley to get a PhD degree in electrical engineering since there was no such thing then as computer science.

At that time there were only a few very large computers in existence, and they were almost totally used for "number crunching."

"I was viewed as being crazy," Dr. Engelbart recalls. When he suggested thesis topics such as using a computer as a teaching machine, or programming a computer to manipulate logic statements, he was taken aside and told, "This is too crazy, too kooky. It will never go anywhere."

He finally did his thesis on the conventional subject of gaseous discharge.

In 1957 Dr. Engelbart brought his dream to SRI, and in 1962 he published the paper which lays out the basis for his later work, "Augmenting Human Intellect: A Conceptual Framework."

"Language is a fantastic cultural invention," Dr. Engelbart reflects. "I just got the image of ways to develop our own human language, to put it in forms where we can review it and manipulate it and make it accurate and communicate it to other people.

"I put the whole thing in a box—language, tools, methodologies (such as committees)" he explains. This box includes the elements of the system designed to help "the mental machinery you were born with."

After the 1962 paper, interest began to build up and funding followed. The federal government and military agencies began to support the research, and the system grew.

What came out was a set of tools, languages and procedures, which form the basis of today's AUGMENT system. Some of the big national computer networks also evolved partially out of the SRI work—ARPANET and later TYMNET, Tymshare's international commercial computer network.

The Mouse was just one of the elements of the system. Dr. Engelbart and his colleagues were looking for a fast, flexible, and efficient device to move a pointer around the video screen and talk back to the computer. After rejecting lightpens and joysticks, Dr. Engelbart suddenly remembered the notebook he always carries in his shirt pocket. "I went back to my little notebook," he says and there was an idea for a device which could be easily moved around a flat surface to guide the pointer on the screen.

Hence, the Mouse. "It was one more chance to organize material more like the concepts in your mind," he says.

A pinnacle of Dr. Engelbart's SRI career came with the first full-scale demonstration of his system at a 1968 computer show.

Dr. Engelbart sat on a stage in San Francisco with a 20-foot screen above him showing what he was doing. For an hour and a half he shifted windows, edited prose, and moved words and paragraphs—something revolutionary then—in front of a packed auditorium. Then, through a TV link he demonstrated how he could manipulate and edit text jointly on the same screen with his colleagues at SRI 40 miles away.

At the end he got a standing ovation. "Everyone stood up and cheered," he recalls with awe. "I've never seen that at a computer conference."

Now in his Tymshare office Dr. Engelbart demonstrates the systems he has been perfecting since his early days at SRI. A Mouse in his right hand and a set of five piano-like keys in his left, he plays the computer like a piano as words, paragraphs, headings, windows, references, pictures move swiftly and surely across the screen. "We can deal in headings, paragraphs, chapters, you name it," he says.

Time runs out before he can demonstrate all the features of a system which covers far more than word processing. AUGMENT also allows split windows, where people in different parts of the country can edit jointly, provisions to send electronic letters to stations in the network anywhere in the world, provisions to look up answers in data banks, and more.

Warming up, he describes his dream to use an augmentation system "like a vehicle that can fly through information space and construct pictures of what it looks like in any perspective or form you want."

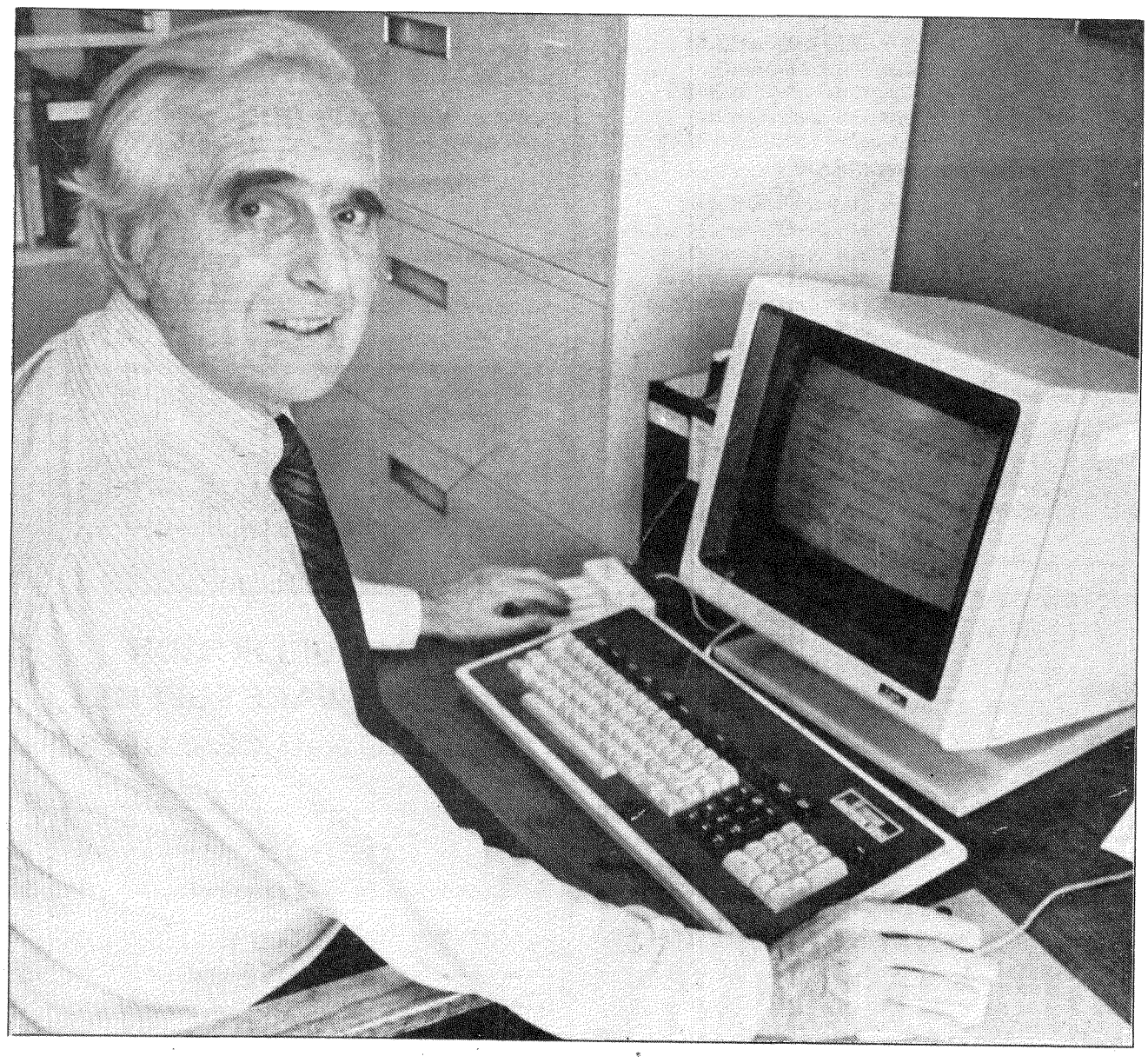
GETTING FROM HERE TO THERE

Dr. Engelbart is aiming his own system not at secretaries and typists but at the "knowledge workers." These are the planners and engineers and mathematicians and financial analysts who will process information and ideas in more and more complex ways.

In Dr. Engelbart's dream high performance teams of these specially trained people will work in sophisticated new "knowledge workshops" equipped with the most powerful equipment to augment their skills. These will be "a different breed of person and activity," he believes.

Among the special tools at their disposal will be artificial intelligence systems. "Artificial intelligence will produce an ever-improving set of capabilities that can be integrated into a workshop," he says.

However, Dr. Engelbart warns that future computers and their systems should not be allowed to take over. "We don't want to get into an environment of supplanting humans," he concludes. "We should maximize the human pursuit of human goals."



MOUSE INVENTOR Douglas Engelbart of Atherton demonstrates his pioneering system to AUGMENT human intellect in his office at Tymshare in Cupertino. With a set of keys in his left hand and a mouse in his right, he can play the computer like a piano. Photo by Marion Softky