

One Perspective on the Information Revolution

by Lee Frank

The economic upheaval of the last century we call The Industrial Revolution was really two revolutions. The first was the increase of power and control over machines. The second was the application of that revolution to transportation. This second revolution was not possible without the first.

In this century history is repeating itself. We have two more revolutions commonly perceived as one. The first is the transformation of the machine from increased power for muscles to increased power for the mind – the computer. The second revolution is also a transformation. The transportation of things has become the transportation of mind – communications. Having left its horse and buggy days of the telegraph and the telephone only yesterday, communications is quickly reshaping the world as it combines with computers.

Transportation in the nineteenth century increased by magnitudes as it integrated with the new machinery. Today's communication will grow by orders of magnitude as it incorporates the power of computers. And like the last century, we will have to face the problems of economic and social upheaval generated by this new Information Revolution.

There are those who have questioned whether this is truly a revolution in the same sense as the Industrial Revolution. They fail to understand we are still in the early stages. Changes in transportation could not claim to be a revolution until nations were internally connected by rail and externally connected by steam on land or water.

Here, in the most computerized nation in the world, many computers are still isolated. Metaphorically speaking, our communications revolution is still laying non-standard tracks. In fact, the computer revolution, while it may be obvious to everyone, is still a considerable distance from establishing its own standards. Peter Drucker's observation (1968) is still true: the computer industry lacks the equivalent of the light bulb and socket.

While all this is true for today, tomorrow's dreams are still pulling us into the future. Three are particularly relevant: SketchPad, DynaBook, and the Information Valet. Respectively, they date from the middle sixties, the early seventies, and the late eighties. As yet, none has been fully realized.

In 1965, I was privileged to see tomorrow. This happened at The International Federation of Information Processing Societies conference in New York. IFIPS is an annual international event, rarely held in the U.S. There I saw Ivan Sutherland talk about a computer program called SketchPad.

While SketchPad was originally a graduate thesis and spoke only of computer displays, many of us in the audience felt as if we had shared a vision of the Holy Grail. The holodeck of the Star Trek is close to Sutherland's ideal. (If the name is not familiar, this is the Sutherland who begat ARPA which became DARPA which spawned the Internet.)

Although I had been in computing less than a year, I had seen its future. Decades before anyone used the words, SketchPad promised virtual reality – and more. Sutherland talked of experiencing, through the computer, worlds that never were and never could be. The example he gave was Alice in Wonderland.

A few years later, I heard about another far out computer idea. A friend told me about this genius friend of hers. She described the idea only in general terms, but I again I saw the future. Later I discovered this friend was Alan Kay and the concept was called DynaBook.

Kay and his ideas became a moving force in computing. First at Xerox, where a system called STAR pioneered one of the earliest graphic user interfaces (GUI). STAR was mother to both the Macintosh and Windows GUIs.

DynaBook was simply a device the size and shape of one book that could contain many books. More than a dozen years before CD-ROM, DynaBook suggested viewing libraries with a hand held display. Today's notebook computers measure 8 ½ by 11 inches and weigh 3 ½ pounds. DynaBook is no longer the distant future.

The personal DynaBook could be the salvation of libraries everywhere. After selecting the books you wish to take out, the library's computer would download them into your DynaBook. No more lost or damaged books. No more lugging stacks of books home. You don't even have to return the books.

In the late eighties, Mike Tully and I envisioned the need for computers to perform personal information services. The problem as we saw it was that individuals needed help accessing and controlling information. The personal computer was fine for empowering the individual, but hardware itself doesn't solve the problem.

By combining Artificial Intelligence with knowledge bases and search algorithms, we came up with the Information Valet. An Information Valet would help users cope with the information explosion in two ways. It would know what was available and help you access it. It would also keep track of your information interests and acquisitions.

Without something like an Information Valet, the average person will never benefit from the Information Revolution. An example of this barrier is the relative sophistication required to access online information. One step toward solving this problem is software like CompuServe's Information Manager. It replaces the one-dimensional labyrinth of the real-time command line interface with a GUI. It offers a map, if you will, instead of a series of signposts.

But easier interfaces are rare and idiosyncratic. An Information Valet, on the other hand, could be an interface to all of these various interfaces. While we don't claim this idea is as far-seeing as SketchPad or DynaBook, we feel it is essential to mastering the Information Revolution.

As a standalone device, DynaBook may be no more than a year or two in the future (1993). As a component of future libraries, it's probably five years away. [It did arrive, but not marketed well enough to penetrate.] SketchPad, in its lesser implementations, is already here. The holodeck as envisioned on Star Trek however, is still centuries in the future. And as exciting as both these ideas are, neither will harness the information explosion. Neither is a solution for information anxiety.

As always, the solution lies in asking the right questions. I believe the question is, "What does the individual need to participate in the Information Revolution." While SketchPad and DynaBook are very powerful concepts, they are only individual tools. What the individual needs is personal help, an intelligent assistant, an Information Valet.