

## OUTRO

One of the true godfathers of the Internet was a man by the name of J. C. R. Licklider. In the 1950s, he worked at Bolt, Beranek & Newman, which would go on to build the computers that were connected to the first four nodes of the ARPANET. In the early 1960s, Licklider was the head of the Information Processing Techniques Office at ARPA, which would go on to fund the ARPANET. In 1963, he wrote the key internal paper that would plan for, and ultimately make the case for, the development of the ARPANET, the key precursor to today's Internet.

But like most computer scientists of his era, Licklider was also a theoretical visionary. In 1960, he wrote a paper called "Man-Computer Symbiosis," which is considered a fundamental text of modern computer science.

In 1960, as today, there were many who believed that true artificial intelligence was just around the corner. Licklider, however, put his money on cybernetics, the idea that man would meld with machine. In "Man-Computer Symbiosis," Licklider argued that thinking machines many orders of magnitude smarter than humans might arrive someday. They might even be inevitable. But in the meantime:

There will nevertheless be a fairly long interim during which the main intellectual advances will be made by men and computers working together in intimate association.

The hope is that, in not too many years, human brains and computing machines will be coupled together very tightly and that the resulting partnership will think as no human brain has ever thought and process data in a way not approached by the information-handling machines we know today.

. . . Men will set the goals, formulate the hypotheses, determine the criteria, and perform the evaluations. Computing machines will do the routinizable work that must be done to prepare the way for insights and decisions in technical and scientific thinking. Preliminary analyses

indicate that the symbiotic partnership will perform intellectual operations much more effectively than man alone can perform them.

At its core, the Internet Era represents that “fairly long interim” that Licklider envisioned, where humanity and computers came together in profound ways. First, we connected all the world’s computers together. Then, we uploaded all of humanity’s collected knowledge into the virtual space that networks created. Then, we made all of that knowledge searchable. We tied our commerce systems, our financial systems, even our media and information systems, to the network. We created a world where any good, any piece of media, any piece of art, any fact or thought, any idea or meme, is available, on call, for the instant gratification of any curiosity or desire. Over the course of a decade, we learned how to behave, and then to actually live with this new networked paradigm—to actually *exist in* this virtual environment. With social media, we connected ourselves together just as comprehensively as we had connected all the computers. And then, we started wearing actual supercomputers on our bodies, taking them with us at every waking moment of our days, to navigate, not only the intellectual, the social, but even the physical space of modern life. And we did all this unbidden, undirected, unplanned—almost as if we were following a biological impulse, guided by some unconscious evolutionary imperative.

When you see everyone around you hunched over the glowing screens of their smartphones, you’re seeing the fulfillment of the intimate association of man and machine that Licklider envisioned.

But are we better off? Are we truly thinking as no human brain has ever thought, just as Licklider supposed?

That’s the open-ended question as the Internet Era continues.