PASSAGE I

This passage is adapted from a book about the future of technology.

The catchphrase "information age" is widely used but often with only casual effort to unpack its meaning. For many, this phrase means little more than the fact that computers and associated technologies are involved. Yet, it is clear that we are in the throes of the third great transformation of human communication.

Before any form of communication was possible, there must have been human thought. We all have an experience of an inner life in which we look into our minds or reflect upon our thoughts, but our inner thoughts are not, in and of themselves, accessible to others. To be sure, a scream, a sigh, or a grunt may signal pain, satisfaction, or disapproval; but raw experience is not thought. Instead, what was needed was a system of symbols to express thoughts in ways that were susceptible to understanding by others, that is, a code. Speech sounds represent cognitions; and as language has developed, increasing richness and subtlety of expression have become possible.

With speech, the knowledge of individuals could not only be communicated, it could be accumulated, and so society began to acquire a common wisdom—stored usually in the brains of elders. By memorizing the accumulated knowledge and passing it on to successive generations by word of mouth, the product of human minds achieved a durability beyond the life of a single human.

The second transformation occurred with the development of a code that made use of graphic symbols to record speech. The earliest known use of graphics is the cave drawings of the Upper Paleolithic period, 30,000 to 10,000 BCE, but these drawings were not yet a primitive form of writing—only a way to represent important events in the same way as primitive music and dance. The first true use of graphic symbols to codify speech did not occur until around 3,500 BCE or about 500,000 years after humans evolved an oral tradition. The invention of the printing press, which made books, newspapers, magazines and other printed matter available to everyone who could read, belongs to this second transformation.

We are now in the throes of a third transformation in communications, though when it began exactly is difficult to say. One might choose that evening of 1844 when Samuel Morse telegraphed the message "What has God wrought!" Or possibly the invention by Charles Babbage of the "Analytic Engine," a mechanical device that prefigured the modern electronic computer. Or the ENIAC computer developed during World War II, the first digital electronic computer. In any case, it is estimated that it took about 150,000 years for human knowledge to first double, then 1,500 years for it to double again, and that it now doubles every 15 years or less.