Book Reviews

The Control Revolution
Technological and Economic Origins of the Information Society
By James Beniger
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Telematic society. Wired society. Technetronic era. Micromillennium. Post-industrial age. Network nation. Information age. With each new analysis of the social impact of the information industry comes yet another label for our era. Whatever it is called, the popular understanding is that the information age (or whatever) began after World War II with the commercial development of computing and electronic communications.

But did it? James Beniger, a professor at the University of California's Annenberg School of Communications, has just published a masterful work of social and technological analysis that traces the roots of the information industry much further into the past. He makes a compelling case that the foundation of the information industry is not ENIAC or UNIVAC, but Remington's typewriter, NCR's cash register, Burrough's adding machine, and Hollerith's punch card tabulating equipment—all information processing innovations that preceded the electronic computer by almost 60 years.

The heart of Beniger's book, *The Control Revolution*, is an assessment of the role of communications and information processing in the development of the modern economy. He starts by showing how "the persistence of the family partnership as the dominant form of commercial organization until well into the 19th century" was the result of "the need to control widely dispersed transactions without adequate telecommunications or effective legal sanctions."

Beniger views the transformation of a traditional society into a modern society as one that "seems to correspond less to ideological or religious changes than to the development of alternative means of control."

It was the 1840s that gave the first great kick to the development of information processing. That decade brought coal-powered factory production, railroads, and the telegraph—innovations that sped up material processing beyond the rate possible with only human- and animal-powered transportation and communications.

According to Beniger, this speeding up of the entire societal processing system brought about a control crisis in the late 19th century, first in transportation (railroads were limited to regional enterprises by the inability of managers to meet the need for inter-regional communications), and then in production. In the 1880s, the adoption of continuous processing technologies in the production of flour, soap, cigarettes, canned foods, etc., forced manufacturers to create new markets to stimulate and control consumption for the vast quantities of goods they were now able to produce.

From this crisis came the control revolution, the title of Beniger's book. Following the application of energy to the production process, manufacturers pioneered what Beniger terms "a revolutionary new technology for the control of consumption: national advertising of a brand name product directly for the mass household market." This combination of centralized mass production, consumer packaging, brand labeling, and mass advertising became so critical to the control of consumption that the companies to adopt it were still the dominant manufacturers of consumer goods more than a century later—Campbell, Heinz, Borden, Libby, etc.

In the latter part of the 19th century came the development of other technologies for the control of production and consumption—the telephone, rural free delivery, mass-circulation daily newspapers, etc. "The Industrial Revolution," as Beniger puts it, "which brought about the 19th century crisis of control, began with greatly increased use of coal and steam power; the Control Revolution that eventually resulted was achieved by innovation at a most fundamental level of technology—that of information processing and communication." The crisis of control started "as the growing scope, complexity, and speed of information processing—including inventory, billing, and sales analysis—began to strain the manual handling systems of large business enterprises."

Three primary dynamics—"the coevolution of energy utilization, processing speed, and control; the gains from control technologies that accrued through increasing reliability and predictability; and the increasing control required of control technologies themselves—account for the Control Revolution that has continued unabated from the 1880s to the present." Newer technologies were adopted (radio and television) and mass feedback technologies pioneered (market research, opinion surveys), but the basic crisis in control had been met by information processing technologies long before the first electronic computer.

By 1928 the five largest manufacturers of information-processing equipment were Remington Rand, National Cash Register, Burroughs, IBM, and Underwood. In 1954, three of those five would still top the list.

"The shape of the modern information-processing industry," concludes Beniger, "appears to have been well established—in corporate leadership, growth rate, and profit margins—before World War II."

The importance of this insight is that it helps us to better understand where the world has been and where it is going. "Understanding ourselves in our own particular moment in history will enable us to shape and guide that history," Beniger claims. His analysis of the social and economic impact of information technology is broad and deep. But his treatment of the explicitly political dimension of information technology is less developed. And this is the area that calls for our greatest attention.

As John deButts, former chairman of AT&T put it, "It is not technology that will shape the future of telecommunications in this country. Nor is it the market. It is policy."

Information processing is as potent a source of social, economic, and political change as the application of energy to material processing (the industrial revolution) ever was. But it is not an independent force. As Beniger shows, every application is socially determined by people solving real problems.

Before us lies the opportunity to influence the applications to which our more powerful information storage and processing technologies will be put. Yes, this is the technology of control. But who will control whom? How can this technology enhance rather than diminish the realm of personal freedom? How can it be used for empowerment instead of disempowerment? How can it increase the sense of personal efficacy so critical to a democratic polity instead of crushing it?

"Since at least the Roman Empire," Beniger reminds us, "where an extensive road system proved equally suited for moving either commerce or troops, communications infrastructures have served to control both economy and polity."

Yet the need for critical analysis of this second realm—the impact of the political system on the information industry and the impact of the information industry and online medium on the political system—still lies before us. Beniger shines a clear light on the past. In doing so, he points our inquiry in the right direction, while at the same time reminding us how far we still have to go in applying human will and consciousness to the question of the proper role and function of information technology in our society.

The reviewer is David Lytel, a graduate student in the Department of Government at Cornell University and a frequent contributor to Information Today.