

among the obvious means through which technologies help structure human behavior.

### Subconscious Compliance

Sometimes technologies shape behavior and relationships less through brute compulsion than via subtle, psychological inducement. For example, social scientists have shown that the physical arrangement of chairs and tables strongly influences the kind of social interaction that occurs in schools, nursing homes, and hospitals. Yet the staff in those institutions had previously attributed behavior (including their own) entirely to the mix of personalities and psychological capabilities. They were surprised to learn that simply shifting the furniture could, for instance, help reanimate a seemingly moribund group of mentally impaired hospital inmates.

### Opportunities and Constraints

Social structures are also ambiguous in that while they can restrict opportunities in some respects, they can—when appropriately designed—enhance them in others. For example, well-crafted laws help protect basic civil rights and, by providing a relatively stable and well-ordered social context, make it easier for people to realize their life plans. Besides creating novel opportunities and constraints, technologies also reconfigure prior patterns. For instance, within some offices and factories the proliferation of personal computer networks has enhanced lower level workers' chances to contribute to production decisions while simultaneously challenging midlevel managers' former domains of authority and autonomy. Once deployed, technologies can also aid or hinder the use of other technologies. For instance, telephone systems gradually displaced telegraph services but have more recently facilitated development of computer networks and long-distance data processing.

### Background Conditions as Imperatives

In order to function, technologies require various environmental and organizational background conditions. A television set is only useful so long

as viewers know how to operate it, it is protected from inclement weather, there is access to electricity, programs are being produced and distributed, and so on.

Frequently when individuals or groups acquire new technologies or technological facilities, they are at best only dimly conscious of the demands that effective operation will impose or require to be developed. Several years ago a town near mine in western Massachusetts approved construction of an industrial research center, hoping thereby to realize tax benefits. But no one asked beforehand the eventual costs (financial, environmental, and emotional) that the town would one day bear in order to accommodate both new research activities and the concomitant growth in commuting, ancillary employment, and residential population. These costs could include hazards associated with toxic waste disposal, future loss of open space to new housing, and the burden of upgrading roads, sewer lines, snowplowing capabilities, schools, and school bus lines.

To the extent that a given technology plays only a small part in one's life, maintaining the conditions needed for its operation may be of no particular concern. But as a person or society grows dependent on a technology, the necessary conditions of its operation loom as practical imperatives. The need to support these conditions represents a way in which technologies exert a profound structural social influence.

### Technology as Structural for Nonusers

Often technologies exert comparably significant effects on people who neither operate nor use the technology in question. One clear example involves phenomena that economists label "spillover effects" or "externalities." Homeowners hear neighbors' radios, lawn mowers, or air conditioners; whole communities breathe noxious fumes from an industrial facility. Each person lives in an aesthetic landscape that reflects the aggregate technological choices made by other people or organizations. The psychological texture of our everyday life reflects the influence of