A Theory of the Effects of Advanced Information Technologies on Organizational Design, Intelligence, and Decision Making

GEORGE P. HUBER
University of Texas

This article sets forth a theory of the effects that computer-assisted communication and decision-aiding technologies have on organizational design, intelligence, and decision making. Several components of the theory are controversial and in need of critical empirical investigation. The article focuses on those technology-prompted changes in organizational design that affect the quality and timeliness of intelligence and decision making, as contrasted with those that affect the production of goods and services.

This article draws on the work of organizational researchers, communication researchers, and information systems researchers to set forth, in the form of a set of propositions, a theory concerning the effects that advanced information technologies have on organizational design, intelligence, and decision making. The motivations for such an article are four.

One motivation concerns the need to reinvestigate and possibly revise certain components of organization theory. A large part of what is known about the factors affecting organizational processes, structures, and performance was developed when the nature and mix of communication technologies were relatively constant, both across time and across organizations of the same general type. In contrast, the capabilities and forms of communication technologies have begun to vary, and they are likely to vary a great deal in the future. For example, communication technology (or communication medium) is now a variable whose traditionally relatively constant range (from face-to-face at one extreme to unaddressed broadcast documents at the other, cf. Daft & Lengel, 1984, 1986) is being expanded by organizations to include computer-assisted communication technologies (e.g., electronic mail, image transmission devices, computer conferencing, and videoconferencing) that facilitate access to people inside and outside the organization with an ease that previously was not possible. Also, more sophisticated and more user-friendly forms of computer-assisted decision-aiding technologies (e.g., expert systems, decision-support systems, on-line management information systems, and external information retrieval systems) are in the late stages of development or early stages of implementation. Consequently, as the uses, capabilities, and forms of communication and decision-aiding technologies increase in their range, researchers must reassess what is known about the effects of these technologies because what is known may change. "That is, new media impacts may condition or falsify hypothesized relationships developed by past research"