

Book Reviews

In the Age of the Smart Machine: The Future of Work and Power, by Shoshana Zuboff, Basic Books, New York, NY, 1988, 486 pp., \$19.95.

What is the future of work and power? In a volume extensively documented with social science and managerial literature, Shoshana Zuboff of the Harvard Business School offers a glimpse of that future. The ideal organization in the future will exploit information systems' ability to *informate* – provide new information about processes that have been automated – rather than use the systems simply to *automate*. The ideal, informed organization will assume that its members are equal (though not identical) and will provide ample opportunities for their learning and growth.

In the Age of the Smart Machine is about how computerization transforms the nature of work and work relations. Professor Zuboff bases her analysis on case studies of eight organizations studied over a five year period: two pulp mills, a pulp and paper mill, an operating unit of a telecommunications company, the dental claims operation of an insurance company, the stock and bond transfer offices of a large financial services company, the Brazilian offices of a major bank, and a large pharmaceutical company. These eight are a diverse set of organizations in which introduction of computer-based technology changed fundamentally the way organization members performed their jobs. In the sample are represented white collar, blue collar and professional employees, nearly all of whom worked in their organizations pre- and post-automation, and thus experienced first-hand the computerization process.

The book is divided into three sections. Part One, "Knowledge and Computer Mediated Work", consists of five chapters. Chapter 1 presents an historical analysis of the role of the human body in industrial work, and the development of the familiar gap between workers and managers. Chapter 2 describes how automation removes work from the sentient experience of the laboring body and makes it an abstract experience for the worker. Chapter 3 presents further historical development of white collar work, as contrasted with blue-collar work. White-collar workers use their bodies for *acting-with*, i.e. interpersonal functions, while blue-collar workers use their bodies for *acting-on*, i.e. direct action on inanimate objects such as coal or paper pulp. Automating traditional blue-collar jobs can blur this distinction and move blue-collar workers into the realm of *acting-with*.

Chapter 4 discusses the conflicting abilities of technology to create social isolation in organizations while simultaneously fostering opportunities for integration between people and a deeper understanding of the task. In Chapter 5, Professor Zuboff discusses how the relationship between intellectual skill

and work competence evolves in an automated environment. She argues that management is a type of oral culture, but this quality is changed by automation's ability to *textualize* work – that is, to codify and document actions and communications.

Part Two of the book, “Authority: The Spiritual Dimension of Power”, consists of three chapters which explore the changing face of authority and power in automated environments. Chapter 6 traces historically the belief systems that have supported managerial authority. The informing capacity of computer technology, Professor Zuboff argues, blurs the traditional distinctions between managerial and physical work, and demands widespread reorganization of jobs and job roles. Chapters 7 and 8 explore in detail the dynamics between automation, authority and power. These chapters describe dilemmas stemming from managers's needs and desires to maintain the distinction between themselves and their workers in the face of the technological force toward increased intellectualization of the workers' job. To the extent that managers share knowledge with their subordinates about the automated system, they risk reducing their own authority. The invisibility of automated work can perpetuate the adversarial relationship between managers and workers in automated – but not in informed – environments. Since managers can no longer see how much effort is expended by workers whose jobs primarily involve looking at computer screens, issues of trust arise. Professor Zuboff maintains that an informing strategy sidesteps these problems by allowing organizational processes to be transparent and by making learning the central focus.

In Part Three, “Technique: The Material Dimension of Power”, the book explores specific techniques for maintaining power in automated environments. Chapter 9 describes computer technology as an *information panopticon*. This term refers to an 18th century prison structure that allowed authorities to see into every crevice of the structure, while at the same time limiting the view of its tenants. Through its textualizing capacities, automation can take on this character. In Chapter 10 this idea is further developed through a detailed description of a computer conference in one of the study sites. In this case the technology had the effect of shifting social exchange from an ephemeral entity to one that was highly visible and concrete – again through its textualization capacities.

In the concluding chapter, Professor Zuboff offers her views of the ideal, informed organization. It is one organized in concentric circles around a central core of the electronic data base, in which people's skills at the various rings do not vary qualitatively but rather by the immediacy of their contact with the data interface and the comprehensiveness of responsibilities. She describes this new environment as wholistic, emphasizing learning and requiring managers to manage dynamic and intricate relationships. Traditional hierarchy is replaced by shifting differentials in power, knowledge and responsibility.

The dark side of this new environment, from the workers' point of view, is

the loss of clarity of their rights and responsibilities. To many, increased responsibility and integration with the organization's goals is not necessarily desirable. A socially integrated organization runs the risk of endangering "the balance that must exist between individual and organizational issues". Professor Zuboff warns that organizations following an informing strategy must carefully clarify these issues.

People interested in the social impacts of computer technology or in labor history will like this book. It draws from an impressively wide body of interdisciplinary literature – history, sociology, psychology, anthropology – to support the author's analysis of the changing nature of work and authority in the face of automation. The book's strength is its insightful discussions of the psycho-social effects in the workplace of automation. Through well-chosen anecdotes and quotations drawn from the research sites Professor Zuboff presents a vivid picture of the wrenching changes in the social and task environments in those organizations.

Ironically, I found the extensive documentation of this book to be one of its weaknesses. Professor Zuboff does not wear her erudition lightly and has thus written a ponderous book. Her florid writing style makes it more so. This book is not easy read, and those who are not prepared to dig into it thoroughly should stay away. It won't yield easily its treasures, but it is full of them.

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Dynamic Manufacturing: Creating the Learning Organization, by Robert H. Hayes, Steven C. Wheelwright and Kim B. Clark, The Free Press, New York, NY, 1988, \$24.95.

Since the publication of *In Search of Excellence*, many books have been written describing how and why American companies have lost their competitiveness compared to their Japanese counterparts and what can be done to restore their vitality. At first glance, this book appears to be another in this genre. From the start, Hayes, Wheelwright, and Clark point out that American ingenuity and creativity have been victims of managerial neglect and the inability of financial analysts to calculate the real worth of innovation, thereby sealing the eventual downfall of American corporations. And, like white knights, the authors present a viable plan to reverse the negative trend.

Don't be fooled or put off by this popular format. This book is worth reading by scholars, engineers, and managers, that is, everyone who works in or with any corporation, especially those with high technology products. The authors