

The Digital Hand, Volume 2: How Computers Changed the Work of American Financial, Telecommunications, Media, and Entertainment Industries. By James W. Cortada. Oxford: Oxford University Press, 2006. xiii + 629 pp. Index, notes, bibliography, illustrations. Cloth, \$59.50. ISBN 0-195-16587-X.

Reviewed by Atsushi Akera

James Cortada has written many books on the subject of computers and American business. This is the second installment of *The Digital Hand*, a projected trilogy that sets out to document how computers transformed the structure and conduct of the U.S. industries that account for 80 percent of our national economy. Whereas the first volume focused on manufacturing, retail, and transportation, this one takes up the service industries indicated in the title, considering banking, insurance, and securities under the category of finance; books, magazines, newspapers, radio, and television under the heading of media; and movies, musical recording, video games, and photography as entertainment industries. The third volume will be devoted to government, health care, education, and other enterprises that are either within or influenced by the public sector. The broad subject of the trilogy has to do with the way computers were used, a welcome extension beyond the traditional producer-oriented histories that focus on IBM and other early members of the computer industry.

Without question, this careful study of how information technologies were introduced unearths valuable insights. Cortada traces the stages through which the firms within a given industry introduced digital computers into their payrolls, inventories, and other internal accounting operations; how some went on to develop new products or services based on a more direct use of information technology (IT); and, finally, how a new technical infrastructure and “digital” orientation transformed some industries—but not others. For instance, the structure of the banking and insurance industries remained relatively unaltered by technology (although both were transformed through regulatory changes that were partly facilitated by technology), whereas the U.S. securities and photography industries were thoroughly transformed by new technologies, such as online trading and digital imaging. Cortada reserves explicit comparisons until the end of the

book. Even then, his emphasis remains the unique circumstances and challenges each industry faced, rather than the generalizations that could be inferred from the data. This approach is consistent with his background as a senior management consultant at IBM; it also leads to a number of useful comparisons. Informational industries, such as banking and insurance, were early adopters of the technology; industries whose intense computing requirements were integral to their core products (digital photography for Kodak, for instance) tended to undergo later, accelerated transitions that created predictable managerial challenges. He makes these observations while exploring other important questions, such as comparing the different ways that the service sector and the manufacturing sector deployed IT and how these patterns contributed to the rise of a “new economy.”

Another benefit is the book’s broad historical survey of major U.S. industries. As a seasoned consultant of IT applications, Cortada is clearly as familiar with the industries he studies as he is with the computing systems they have come to employ. Backed by meticulous research, his two volumes to date have traced the historical development of nearly two dozen industries spanning the manufacturing and service sectors of the economy. Impressively, both works cover the entire period from 1945 to the present. This historical scope allows Cortada to test a thesis advanced by economist Richard Langlois, namely, that the visible hand of management may not be the “end game of economic development” (p. 447). New information technologies and infrastructures perhaps enabled new managerial strategies, such as outsourcing and supply-chain management, that remade vertically integrated enterprises into only one of several viable options for structuring an industry. Digital technologies also helped to breach the walls that separated a number of traditional industries (telephony, cable, and Internet service providers, as well as banking, insurance, and securities), complicating the available managerial options. Cortada’s wealth of knowledge about different industries offers readers a unique opportunity to consider the circumstances that in the end favored one structure over another within these different industries.

More broadly, both volumes are set in the context of the Schumpeterian concept of “creative destruction.” Cortada’s notion of the “digital hand” is best understood in terms of whether relatively autonomous developments in technology compelled corporate

managers to abandon locally rational decision-making processes through collective acceptance of the their industry's need to be restructured in order to conform to a new and more efficient mode of production. Here, Cortada hedges his bets, describing many risk-averse decisions (such as the cautious introduction of payroll systems, or Kodak executives' desire to protect their business in film products) as rational economic decisions, while also explaining how new entrants, including firms that crossed traditional industry boundaries (Sony's shift to digital imaging, for example) contributed to a new industry structure. Some industries remained largely unaffected by technological change. While Cortada's analysis in this regard is not inconsistent with Schumpeter's thesis, his explanation of how his own work either modifies or extends the thesis perhaps remains incomplete.

This volume of *The Digital Hand* contains information of considerable value to business historians. However, as an encyclopedic text exceeding six hundred pages, it will probably not be read in its entirety by many readers. Some may choose instead to read the chapters most relevant to their own concerns. It is also worth noting that the book tends to advance a positive view of technology, aided no doubt by Cortada's reliance on published sources, which is understandable, given the scope of his project. As a consequence, the book tends to brush over the difficulties and uncertainties surrounding technological adoption. In my opinion, this does not undermine the book's main arguments. The latest installment of *The Digital Hand* is a valuable contribution to ongoing conversations about the business implications of information technology and the changing face of our economy.

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