References

Anderson, J. R., and Reiser, B. J. (1985). The LISP tutor. *Byte* (April), 159–175.

Attewell, P. (1994). Information technology and the productivity paradox. In D. H. Harris (eds), *Organizational Linkages: Understanding the Productivity Paradox*. Washington, DC: National Academy Press.

Attewell, P., and Rule, J. (1984). Computing and organizations: What we know and what we don't know. *Communications of the ACM, 27*(12), 1184–1191.

Avner, A. R. (1979). Production of computer-based instructional materials. In H. F. O'Neil (ed.), *Issues in Instructional Systems Development*. New York: Academic Press.

Bailey, G. (1993). Iterative methodology and designer training in human-computer interface design. In *INTERCHI'93 Conference on Human Factors in Computing Systems* (pp. 24–29). Amsterdam: ACM.

Baily, M. N. (1982). Productivity growth slowdown by industry. *Brookings Papers on Economic Activities, 2,* 423–454.

Baily, M. N. (1986a). Productivity and the electronics revolution. *Bell Atlantic Quarterly, 3,* 39–48.

Baily, M. N. (1986b). What has happened to productivity growth? *Science*(234), 443–451.

Baily, M., and Chakrabarti, A. K. (1988). *Innovation and the Productivity Crisis.* Washington DC: Brookings Institution.

Baily, M. N., and Gordon, R. J. (1988). *The Productivity Slowdown, Measurement Issues, and the Explosion of Computer Power* (No. 1199). Cambridge, MA: National Bureau of Economic Research.

Baran, B. (1987). The technological transformation of white collar work: A case study of the insurance industry. In H. I. Hartmann (ed.), *Computer Chips and Paper Clips: Technology and Women's Employment* (pp. 25–62). Washington, DC: National Academy Press.

Barnard, P. (1987). Cognitive resources and the learning of human-computer

dialogues. In J. M. Carroll (ed.), *Interfacing Thought: Cognitive Aspects of Human-Computer Interaction.* Cambridge, MA: MIT Press.

Barnard, P. J., and Grudin, J. (1988). Command names. In M. Helander (ed.), *Handbook of Human-Computer Interaction.* Amsterdam: North-Holland.

Barnard, P. J., Hammond, N. V., Morton, J., Long, J. B., and Clark, I. A. (1981). Consistency and compatibility in human-computer dialogue. *International Journal of Man-Machine Studies, 15,* 87–134.

Becker, R. A., and Chambers, J. M. (1984). *S: An Interactive Environment for Data Analysis and Graphics.* Belmont, CA: Wadsworth.

Bellotti, V. (1990). A framework for assessing HCI techniques. In *Interact '90* (pp. 213–218). Amsterdam: Elsevier Science Publishers.

Benoit, C., Cossette, A., and Cardillo, P. (1984). *L'Incidence de la machine à traitement de textes sur l'emploi et le travail.* Ministère du Travail, Canada.

Blair, D. C., and Maron, M. E. (1985). An evaluation of retrieval effectiveness for a full-text document-retrieval system. *Communications of the ACM, 28,* 280–299.

Block, J. H., and Bums, R. B. (1978). Mastery learning. In L. Shulman (ed.), *Review of Research in Education, 4,* Itsaca, IL: Peacock Publishers.

Bloom, B. S. (1984). The 2 sigma problem: The search for methods of group instruction as effective as one to one tutoring. *Educational Researcher, 13,* 4–16.

Boehm, B. W. (1981). *Software Engineering Economics.* Englewood Cliffs, NJ: Prentice-Hall.

Borgman, C. L. (1986). Why are online catalogs hard to use? Lessons learned from information-retrieval studies. *Journal of the American Association for Information Science, 37*(6), 387–400.

Brand, H., and Duke, J. (1982). Productivity in commercial banking: Computers spur advance. *Monthly Labor Review, 105* (December), 19–27.

Bresnehan, T. F. (1986). Measuring the spillovers from technological advance: Mainframe computers in financial services. *American Economic Review, 76* (September), 742–755.

Brooks, F. P. (1987). No silver bullet: Essence and accidents of software engineering. *IEEE Computer, 20,* 10–19.

Brooks, F. P. J. (1975). *The Mythical Man-Month.* Reading, MA: Addison-Wesley.

Brown, C. M. L. (1988). *Human-Computer Interface Design Guidelines.* Norwood, NJ: Ablex.

Brown, J. S. (1991). Research that reinvents the corporation. *Harvard Business Review* (January–February), 102–111.

Brynjolfsson, E., and Hitt, L. (1993). *New Evidence on the Returns to Information Systems.* Cambridge, MA: MIT.

Brynjolfsson, E., Malone, T. W., Gurbaxani, V., and Kambil, A. (1994). Does information technology lead to smaller firms? *Management Science* (in press).

Bureau of Labor Statistics (1993). *Employment and Earnings 40*, no 12.

Burns, M. J., Warren, D. L., and Rudisill, M. (1986). Formatting space-related displays to optimize expert and nonexpert user performance. In *CHI'89 Human Factors in Computing Systems* (pp. 274–280). Boston: Association for Computing Machinery.

Bury, K. F., Boyle, J. M., Evey, R. J., and Neal, A. S. (1985). Windowing versus scrolling on a visual display terminal. *Human Factors, 24*(4), 385–394.

Card, S. K., Moran, T., and Newell, A. (1983). *The Psychology of Human Computer Interaction.* Hillsdale, NJ: Earlbaum.

Card, S. K., Robert, J. M., and Keenen, L. N. (1984). On-line composition of text. In *Proceedings of Interact '84* 1 (pp. 231–236). London: Elsevier.

Chapman, S. D. (1972). *The Cotton Industry in the Industrial Revolution.* London: Macmillan.

CIM success depends on people (1985). *Computer Graphics Today*, pp. 4, 14.

Clark, R. E. (1985). Evidence for confounding in computer-based instruction studies: Analyzing the meta-analysis. *Educational Communication and Technology, 33*(4), 249–262.

Cleverdon, C. (1979). Letter to the editor. *Information Science, 1*(4), 237–238.

Cron, W. L., and Sobel, M. G. (1983). The relationship between computerization and performance: A strategy for maximizing the economic benefits of computerization. *Information and Management, 6*, 171–181.

Cronbach, L. J., and Snow, R. E. (1977). *Aptitudes and Instructional Methods.* New York: Irington.

Cutler, K., and Rowe, C. (1990). Scanning in the supermarket: For better or worse? A case study in introducing electronic point of sale. *Behaviour and Information Technology, 9*(2), 157–169.

David, P. A. (1990). The dynamo and the computer: An historical perspective on the modern productivity paradox. *American Economic Review, 80*(2), 355–361.

David, P. A. (1991). Computer and dynamo: The modern productivity paradox in a not too distant mirror. In *Proceedings of OCED* (pp. 315–347). Paris:

Deming, W. E., (1982). Improvement of quality and productivity through action by management. *National Productivity Review* (Winter), 1991–2, 12–22.

Denison, E. F. (1989). *Estimates of Productivity Change by Industry.* Washington, DC: Brookings Institution.

Dertouzos, M. L. (1990). *Computers and Productivity.* Cambridge, MA: MIT Laboratory for Computer Science.

Dertouzos, M. L., Lester, R. K., and Solow, R. M. (1989). *Made in America: Regaining the Productivity Edge.* Cambridge, MA: MIT Press.

Doob, A. N., Carlsmith, J. M., Freedman, J. L., Landauer, T. K., and Tom, S. Jr. (1969). Effect of initial selling price on subsequent sales. *Journal of Personality and Social Psychology,* 345–350.

Drucker, P. (1988). Information is data endowed with relevance and purpose. *Harvard Business Review* (January–February), 45–53.

Drucker, P. F. (1991). The New productivity challenge. *Harvard Business Review* (November–December).

Drury, C. G. (1983). Task analysis methods in industry. *Applied Ergonomics, 14*(1), 19–28.

Dumais, S. T., and Landauer, T. K. (1984). Describing categories of objects for menu retrieval systems. *Behavior Research Methods, Instruments and Computers, 16*(2), 242–248.

Dumais, S. T., and Schmitt, D. G. (1991). Iterative searching in an online database. In *Proceedings of Human Factors Society* (pp. 396–402). Santa Monica, CA: Human Factors Society.

Dumais, S. T., and Wright, A. L. (1986). Reference by name vs. location in a computer filing system. In *Proceedings of Human Factors Society* (pp. 824–828). Santa Monica, CA: Human Factors Society.

East, H. (1980). Comparative costs of manual and on-line bibliographical searching: A review of the literature. *Journal of Information Science, 2,* 101–109.

Eberts, R. E., and Brock, J. F. (1988). Computer-based instruction. In M. Helander (ed.), *Handbook of Human-Computer Interaction* (pp. 599–627). New York: Elsevier Science Publishers.

Egan, D. E. (1988). Individual differences in human computer interaction. In M. Helander (ed.), *Handbook of Human Computer Interaction* (pp. 543–568). Amsterdam: North-Holland.

Egan, D. E., and Gomez, L. M. (1985). Assaying, isolating and accommodating individual differences in learning a complex skill. In R. Dillon (ed.), *Individual Differences in Cognition.* New York: Academic Press.

Egan, D. E., Remde, J. R., Gomez, L. M., Landauer, T. K., Eberhart, J., and Lochbaum, C. C. (1989). Formative design-evaluation of SuperBook. *ACM Transactions on Information Systems, 7*(1), 30–57.

Enslow, B. (1989). The payoff from expert systems. *Across the Board* (January–February 1989), 54–58.

Feigenbaum, E. A., McCorduck, P., and Nii, H. P. (1988). *The Rise of the Expert Company: How Visionary Companies Are Using Artificial Intelligence to Achieve Higher Productivity and Profits.* New York: Time Books.

Feldberg, R. L., and Glenn, E. N. (1987). Technology and the transformation of clerical work. In R. E. Kraut (ed.), *Technology and the Transformation of White Collar Work.* Hillsdale, NJ: Erlbaum.

Fitts, P. M. (1954). The information capacity of the human motor system in

controlling the amplitude of movement. *Journal of Experimental Psychology, 47,* 301–391.

Fontaine, M. B. (1992). *L'Informatique de l'état: Evaluation du développement de l'informatique et de son impact sur l'efficacité de l'administration.* Paris: La Documentation Française.

Franke, R. H. (1987). Technological revolution and productivity decline: Computer introduction in the financial industry. *Technology Forecasting and Social Change, 31,* 143–154.

Furnas, G. W. (1985). Experience with an adaptive indexing scheme. In *Proceedings of CHI'85* (pp. 16–23). New York: ACM.

Furnas, G. W., Landauer, T. K., Gomez, L., M., and Dumais, S. T. (1987). The vocabulary problem in human system communication. *Communications of the ACM, 30*(11), 964–971.

Gabor, A. (1992). After the pay revolution, job titles won't matter. *New York Times,* May 17, Business Section, p. 5.

Gagne, R. M. (1974). *Principles of Instructional Design.* New York: Holt.

Gagne, R. M. (ed.). (1987). *Instructional Technology: Foundations.* Hillsdale, NJ: Erlbaum.

Gillain, N. (1992). L'Ordinateur est-il soluble dans l'administration publique? *Le Quotidien de Paris,* November 12, p. 13.

Goldsmith, J. (1994). CYC-O. *Wired* (April), 94.

Gollup, F. M. (1985). Analysis of the productivity slowdown: Evidence for a sector-biased or sector-neutral industrial strategy. In W. J. Baumol and K. McLennan (eds.), *Productivity Growth and U.S. Competitiveness* (pp. 160–186). New York: Oxford University Press.

Gomez, L. M., Egan, D. E., Wheeler, E. A., Sharma, D. K., and Gruchacz, A. M. (1983). How interface design determines who has difficulty learning to use a text editor. In *Proceedings of CHI'83 Human Factors in Computing Systems* (pp. 176–181). New York: Association for Computing Machinery.

Gomez, L. M., Lochbaum, C. C., and Landauer, T. K. (1990). All the right words: Finding what you want as a function of richness of indexing vocabulary. *Journal of the American Society for Information Science, 41,* 547–559.

Good, M. D., Whiteside, J. A., Wixon, D. R., and Jones, S. J. (1984). Building a user-derived interface. *Communications of the ACM, 27*(10), 1032–1043.

Gordon, J. A. (1989). Desktop publishing: Separating dreams from reality. *Public Relations Journal, 45*(11), 24–30.

Gould, J. D. (1981). Composing letters with computer-based text editors. *Human Factors, 23,* 593–606.

Gould, J. D. (1988). How to design usable systems. In M. Helander (ed.), *Handbook of Human Computer Interaction.* Amsterdam: North Holland.

Gould, J. D., Alfaro, L., Finn, R., Haupt, B., Minuto, A., and Salaun, J. (1987).

Why reading was slower from CRT displays than from paper. In *CHI + GI'87 Conference on Human Factors in Computing Systems,* (pp. 7–11). Toronto: ACM.

Gould, J. D., Boies, S. J., Levy, S., Richards, J. T., and Schoonard, J. (1987b). The 1984 Olympic message system: A test of behavioral principles of system design. *Communications of the ACM, 30*(9), 758–769.

Gould, J. D., Boies, S. J., and Lewis, C. (1991). Making usable, useful, productivity-enhancing computer applications. *Communications of the ACM, 34*(1), 75–85.

Gould, J. D., Conti, J., and Hovanyecz, T. (1983). Composing letters with a simulated typewriter. *Communications of the ACM, 26,* 295–308.

Gould, J. D., and Lewis, C. (1985). Designing for usability: Key principles and what designers think. *Communications of the ACM, 28*(3), 300–311.

Grady, R. B. (1992). *Practical Software Management and Process Improvement.* Englewood Cliffs, NJ: Prentice-Hall.

Grant, E. E., and Sackman, H. (1967). An exploratory investigation of programmer performance under on-line and off-line conditions. *IEEE Transactions on Human Factors in Electronics, HFE-8*(1), 33–51.

Gray, W. D., John, B. E., and Atwood, M. E. (1992). The precis of project Ernestine, or, an overview of a validation of GOMS. In *Proceedings CHI'92, Human Factors in Computing Systems.* Monterey: ACM.

Greene, S. L., Cannata, P. E., and Gomez, L. M. (1990). No IF's AND's or OR's: A study of database querying. *International Journal of Man Machine Systems, 32,* 303–326.

Greene, S. L., Gomez, L. M., and Devlin, S. J. (1986). A cognitive analysis of database query production. In *Proceedings of the Human Factors Society* (pp. 9–13). Santa Monica, CA: Human Factors Society.

Greenstein, J. S., and Arnaut, L. Y. (1988). Input devices. In M. Helander (eds.), *Handbook of Human Computer Interaction.* Amsterdam: Elsevier Science Publishers (North Holland).

Haynes, R. M. (1990). The ATM at age twenty: A productivity paradox. *National Productivity Review, 9*(3), 273–280.

House, C. H., and Price, R. L. (1991). The return map: Tracking product teams. *Harvard Business Review* (January–February).

Houwing, E. M., Withoff, M., and Arnold, A. G. (1993). Interface evaluation from users' point of view: Three complementary measures. In S. Ashlund Mullet, K., Henderson, A., Hollnagel, E. and White, T. (eds.), *Interchi'93, Conference on Human Factors in Computing Systems,* Adjunct Proceedings, 1993 (pp. 197–198). Amsterdam: ACM.

Hunt, H. A., and Hunt, T. L. (1986). *Clerical Employment and Technological Change.* Kalamazoo MI: W. E. Upjohn Institute.

Instone, K., Teasley, B. M., and Leventhal, L. M. (1993). Empirically-based redesign of a hypertext encyclopedia. In *INTERCHI'93 Conference on Human Factors in Computing Systems* (pp. 500–506). Amsterdam: ACM.

Jeffries, R. J., Miller, J. R., Wharton, C., and Uyeda, K. M. (1991). User interface evaluation in the real world: A comparison of four techniques. In *CHI'91 Human Factors in Computing Systems* (pp. 119–124). New Orleans: ACM.

Johnson, B. M., and Rice, R. E. (1987). *Managing Organizational Innovation: The Evolution from Word Processing to Office Information Systems*. New York: Columbia University Press.

Johnson, O. (ed.) (1989). *Information Please Almanac, Atlas and Yearbook*. Boston: Houghton Mifflin.

Jones, K. (1993). E.D.S. set to restore cash-machine network. *New York Times,* March 26, p. D3.

Jones, W. P., and Dumais, S. T. (1986). The spatial metaphor for user interfaces: Experimental tests of reference by name versus location. *ACM Transactions on Office Information Systems, 4*(1), 42–63.

Jorgenson, D., Gollop, F., and Fraumeni, B. (1987). *Productivity and U.S. Economic Growth*. Cambridge, MA: Harvard University Press.

Juran, J. M. (1989). *Juran on Leadership for Quality*. New York: Free Press.

Karat, C. M. (1990). Cost-benefit analysis of usability engineering techniques. In D. Diaper (ed.), *Human Computer Interaction—Interact 90* (pp. 351–356). Amsterdam: Elsevier.

Keister, R. S., and Gallaway, G. R. (1983). Making software user friendly: An assessment of data entry performance. In *Proceedings of the Human Factors Society* (pp. 1031–1034). Santa Monica, CA: Human Factors Society.

Kendrick, J. W. (1982). Interindustry difference in productivity growth. In W. Fellner (ed.), *A Study in Contemporary Economic Problems, 1982* (pp. 6–25). Washington, DC: American Enterprise Institute.

Kendrick, J. W. (1988). Technology and the services sector. In B. R. Guile and J. B. Quinn (eds.), *Technology in Services*. Washington, DC: National Academy Press.

Kieras, D., and Polson, P. (1985). An approach to the formal analysis of user complexity. *International Journal of Man-Machine Studies, 22,* 365–394.

Kling, R. (1991). Behind the terminal: The critical role of computing infrastructure in effective information system development and use. In W. Cotterman and J. Senn (eds.), *Challenges and Strategies for Research in Systems Development*. London: Wiley.

Kraut, R., Dumais, S., and Koch, S. (1989). Computerization, productivity, and quality of work-life. *Communications of the ACM, 32*(2), 220–238.

Kraut, R. E., and Streeter, L. A. (in press). Coordination in large scale software development. *Communications of the ACM*.

Kuhn, T. S. (1977). *The Essential Tension: Selected Studies in Scientific Tradition and Change.* Chicago, Il: University of Chicago Press.

Kulik, J. A., Kulik, C. C., and Cohen, P. A. (1980). Effectiveness of computer-based college teaching: A meta-analysis of findings. *Review of Educational Research, 50*(4), 525–544.

Kulik, C. C., Kulik, J. A., and Shwalb, B. J. (1986). The effectiveness of computer-based adult education: A meta-analysis. *Journal of Educational Computing Research, 2*(2).

Landauer, T. K. (1988a). Education in a world of omnipotent and omniscient technology. In R. S. Nickerson and P. P. Zodhiates (eds.), *Technology in Education: Looking toward 2020.* Hillsdale, NJ: Erlbaum.

Landauer, T. K. (1988b). Research methods in human-computer interaction. In M. Helander (ed.), *Handbook of Human Computer Interaction* (pp. 905–927). Amsterdam: North-Holland.

Landauer, T. K. (1992). Let's get real, a position paper on the role of cognitive psychology in the design of humanly useful and usable systems. In J. C. Carroll (ed.), *Designing Interaction* (pp. 60–73). Cambridge: Cambridge University Press.

Landauer, T. K., and Bjork, R. A. (1978). Optimal rehearsal patterns and name learning. In M. M. Gruneberg, Morris, P. E., and Sykes, R. N. (eds.), *Practical Aspects of Memory.* London: Academic Press.

Landauer, T. K., Egan, D. E., Remde, J. R., Lesk, M. E., Lochbaum, C. C., and Ketchum, D. (1993). Enhancing the usability of text through computer delivery and formative evaluation: The SuperBook project. In C. McKnight, A. Dillon, and J. Richardson (eds.), *Hypertext: A Psychological Perspective.* New York: Ellis Horwood.

Landauer, T. K., Galotti, K. M., and Hartwell, S. (1983). Natural command names and initial learning: A study of text editing terms. *Communications of the ACM, 26,* 495–503.

Landauer, T. K., and Nachbar, D. W. (1985). Selection from alphabetic and numeric menu trees using a touch screen: Breadth, depth and width. In *CHI'85 Human Factors in Computing Systems.* Gaithersburg, MD: Association for Computing Machinery.

Lee, E., MacGregor, J., Lam, N., and G., C. (1986). Keyword-menu retrieval: An effective alternative to menu indexes. *Ergonomics, 29,* 115–130.

Leontief, W., and Duchin, F. (1986). *The Future Impact of Automation on Workers.* New York: Oxford University Press.

Loveman, G. W. (1986). The productivity of information technology capital: An economic analysis. *MIT,* January 21.

Loveman, G. W. (1990). *An Assessment of the Productivity Impact of Information Technologies.* Cambridge, MA: MIT, Sloan School of Management.

Lucus, H. C. (1978). Unsuccessful implementation; the case of a computer-based order entry system. *Decision Sciences, 9,* 68–79.

McKinsey Global Institute (1992). *Service Sector Productivity.* NY: McKinsey and Co.

McKnight, C., Dillon, A., and Richardson, J. (1991). A comparison of linear and hypertext formats in information retrieval. In R. Macaleese and C. Green (eds.), *HYPERTEXT: State of the Art.* Oxford: Intellect.

McLeod, P. L. (1992). An assessment of the experimental literature on electronic support group work: Results of a meta-analysis. *Human Computer Interaction, 7*(3), 257.

Maddison, A. (1991). *Dynamic Forces in Capitalist Development.* New York: Oxford University Press.

Majchrzak, A. (1992). Management of technological and organizational change. In G. Salvendy (ed.), *Handbook of Industrial Engineering.* New York: Wiley.

Mandel, M. J., and Farrell, C. (1993). Jobs, jobs, jobs—eventually. *BusinessWeek,* June 14, pp. 72–73.

Mantei, M. M., and Teory, T. J. (1988). Cost/benefit analysis for incorporating human factors in the software lifecycle. *Communications of the ACM, 31*(4), 428–439.

Marshall, C., Nelson, C., and Gardiner, M. M. (1987). Design guidelines. In M. M. Gardiner and B. Christie (eds.), *Applying Cognitive Psychology to User Interface Design* Chichester, UK: Wiley.

Martin, J., and McClure, C. (1983). *Software Maintenance: The Problem and Its Solution.* Englewood Cliffs, NJ: Prentice-Hall.

Mayhew, D. J. (1992). *Principles and Guidelines in Software User Interface Design.* Englewood Cliffs, NJ: Prentice-Hall.

Meyer, N. D., and Boone, M. E. (1987). *The Information Edge.* New York: McGraw-Hill.

Milsted, U., Varnild, A., and Jorgensen, A. H. (1989). Hvordan sikres kvaliteten af brugergraesnsefladen i systemudviklingen (Assuring the quality of user interfaces in system development.). In *NorDATA'89 Joint Scandinavian Computer Conference* (pp. 485–490). Copenhagen, as cited in Nielsen, J., and Molich, R. (1990). Heuristic Evaluation of User Interfaces. *Proceedings ACM CHI'90* (pp. 249–256). Seattle, WA: ACM.

Moad, J. (1991). Budget growth skids to 3.4%. *Datamation* (April), 44–47.

Mokyr, J. (1990). *The Lever of Riches: Technological Creativity and Economic Progress.* New York: Oxford University Press.

Morgan, C., Williams, G., and Lemmons, P. (1983). An interview with Wayne Rosing, Bruce Daniels and Larry Tesler. *Byte, 8*(2), 90–114.

Muller, M. J. (1992). Retrospective on a year of participatory design using the PICTIVE technique. In *CHI'92 Human Factors in Computing Systems* (pp. 455–462). Monterey, CA: ACM.

Muller, M. J., Dayton, T., and Root, R. (1993). Comparing studies that compare

usability assessment methods: An unsuccessful search for stable criteria. In *IN-TERCHI'93 Human Factors in Computing Systems: Adjunct Proceedings.* Amsterdam: ACM.

Murphy, C. E. (1985). A comparison of manual and on-line searching of government document indexes. *Government Information Quarterly, 2*(2), 169–181.

Myers, B. A., and Rosson, M. B. (1992). Survey on user interface programming. In *CHI'92 Human Factors in Computing Systems* (pp. 195–202). Monterey, CA: ACM.

Nasar, S. (1993). 90's may be a decade of growth. *New York Times,* February 17, pp. D1, D18.

National Research Council (1994a). *Information Technology in the Service Society: a Twenty-First Century Lever.* Washington, DC: National Academy Press.

National Research Council (1994b). *Organizational Linkages: Understanding the Productivity Paradox.* Washington, DC: National Academy Press.

Nielsen, J. (1989). Usability engineering at a discount. In G. Salvendy and M. J. Smith (eds.), *Designing and Using Human-Computer Interfaces and Knowledge Based Systems* (pp. 394–401). Amsterdam: Elsevier Science Publishers.

Nielsen, J. (1992). *Applying Heuristic Evaluation to a Highly Domain-Specific User Interface.* Technical memorandum. Morristown, NJ: Bellcore.

Nielsen, J. (1993a). Iterative user interface design. *IEEE Computer,* in press

Nielsen, J. (1993b). *Usability Engineering.* Boston: Academic Press.

Nielsen, J., and Landauer, T. K. (1993). A mathematical model of the finding of usability problems. In *INTERCHI'93, ACM Conference on Human Factors in Computer Systems* (pp. 206–213). Amsterdam: ACM.

Nielsen, J., and Levy, J. (in press). Subjective user preferences versus objective interface performance measures. *Communications of the ACM.*

Nielsen, J., and Molich, R. (1990). Heuristic evaluation of user interfaces. In *Proceedings ACM CHI'90 Conference on Human Factors and Computing Systems* (pp. 249–256). Seattle WA: ACM.

Nielsen, J., and Phillips, V. E. (1993). Estimating the relative usability of two interfaces: Heuristic, formal and empirical methods compared. In *INTERCHI'93 Human Factors in Computer Systems.* Amsterdam: ACM.

Nilsen, E., Jong, H., Olson, J. S., and Polson, P. G. (1992). Method engineering: From data to model to practice. In *CHI'92* (pp. 313–320). Monterey, CA: ACM.

O'Neal, J. (1976). We increased typing productivity 340%. *Office* (February), 95–100.

Orlansky, J., and String, J. (1979). *Cost-effectiveness of computer based instruction in military training.* Washington, D.C. Institute for Defense Analysis.

Osterman, P. (1986). The impact of computers on the employment of clerks and managers. *Industrial Labor Review, 39* (January 1986), 175–186.

Paap, K. R., and Roske-Hofstrand, R. J. (1988). Design of menus. In M. Helander (ed.), *Handbook of Human Computer Interaction* (pp. 205–235). Amsterdam: Elsevier.

Perlman, G. (1988). Teaching user-interface development to software engineers. In Proceedings of the *Human Factors Society*. (pp. 391–394). Santa Monica, CA: Human Factors Society.

Petroski, H. (1982). *To Engineer Is Human*. New York: Random House.

Phillips, M. D., Bashinski, H. S., Ammerman, H. L., and Figg, C. M. J. (1988). A task analytic approach to dialogue design. In M. Helander (ed.), *Handbook of Human Computer Interaction*. Amsterdam: North-Holland.

Pinsky, D. (1991). $9 billion Minitel. *France Telecom dans L'actualité* (September).

Pressman, R. S. (1992). *Software Engineering: A Practitioner's Approach*. New York: McGraw-Hill.

Roach, S. S. (1985). *The New Technology Cycle*. New York, Morgan Stanley Economic Perspectives.

Roach, S. S. (1987). America's technology dilemma: A profile of the information economy. Memorandum. Morgan Stanley.

Roach, S. S. (1988). Technology and the services sector: The hidden competitive challenge. In *Technological Forecasting and Social Change*. New York: Elsevier.

Roach, S. S. (1991). Services under siege—The restructuring imperative. *Harvard Business Review*, 82–91.

Roach, S. S. (1992a). *Assessing the Impacts of a Productivity-Led Recovery*. New York, Morgan Stanley.

Roach, S. S. (1992b). *Inside the U.S. Economy*. New York, Morgan Stanley.

Roach, S. S. (1992c). *Technology Imperatives*. New York, Morgan Stanley.

Roberts, T. L., and Engelbeck, G. (1989). The effects of device technology on the usability of advanced telephone functions. *CHI'89 Proceedings*, 331–337. New York: ACM.

Roberts, T. L., and Moran, T. P. (1983). The evaluation of text editors: Methodology and empirical results. *Communications of the Association for Computing Machinery, 26*, 265–283.

Roose, T. (1985). Online or print: Comparing costs. *Library Journal*, September 15.

Solow, R. M. (1959). Investment and technical progress. In K. J. Arrow, S. Karlin, and P. Suppes, (eds.), *Mathematical Methods in the Social Sciences* Stanford, CA: Stanford University Press.

Srinivasan, A. (1992). Are there cost savings from bank mergers? *Federal Reserve Bank of Atlanta Economic Review, 77* (March), 17–28.

Strassmann, P. A. (1985). *Information Payoff: The Transformation of Work in the Electronic Age.* New Canaan, CT: The Information Economics Press.

Strassmann, P. A., Berger, P., Swanson, E. B., Kriebel, C. H., and Kauffman, R. J. (1988). *Measuring Business Value of Information Technology.* Washington, D.C.: ICIT Press.

Strassmann, P. (1990). *The Business Value of Computers: An Executive's Guide.* New Canaan, CT: Information Economics Press.

Streeter, L. A., Acroff, J. M., and Taylor, G. A. (1983). On abbreviating command names. *Bell System Technical Journal, 62,* 1807–1826.

Streeter, L. A., Kraut, R. E., Lucas, H. C., and Caby, L. (in press). The impact of national data networks on firm performance and market structure. *Communications of the Association for Computing Machinery.* New York: ACM.

Taylor, D. W., Berry, P. C., and Block, C. H. (1958). Does group participation when using brainstorming facilitate or inhibit creative thinking? *Administrative Science Quarterly, 3,* 23–47.

Temple, Barker, & Sloan (1990). *The Benefits of the Graphical User Interface.* Temple, Barker & Sloan. Unpublished report.

Tesler, L. (1983). Enlisting user help in software design. *SIGCHI Bulletin, 14*(1), 5–9.

Thor, C. G. (1990). Getting the most from productivity statistics. *National Productivity Review, 9*(4), 457–466.

Thor, C. G. (1994). *Perspectives '94.* American Productivity and Quality Center. Washington, D.C.

Thurow, L. C. (1981). Solving the productivity problem. In L. C. Thurow A. Packer, and H. J. Samuels (eds.), *Strengthening the Economy: Studies in Productivity* (pp. 9–19). Washington, DC: Center for Democratic Policy.

Tognazzini, B. (1992). *Tog on Interface.* Reading, MA: Addison-Wesley.

Trollip, S. R., and Sales, G. (1986). Readability of computer-generated fill-justified text. *Human Factors* (April), 159–163.

Tullis, T. S. (1981). An evaluation of alphanumeric, graphic and color information displays. *Human Factors, 25,* 541–550.

United States Department of Labor (1983). *Productivity Measures for Selected Industries, 1954–82.* Washington, DC: Government Printing Office.

Vacc, N. N. (1991). Word processing and handwriting: Writing samples produced by at-risk freshmen. *Journal of Educational Technology Systems, 19*(3), 233–250.

Virzi, R. A. (1992). Refining the test phase of usability evaluation. *Human Factors, 34*(4), 457–468.

Wasserman, A. S. (1991). Debate: Can research reinvent the corporation? *Harvard Business Review* (March–April), 175.

Weizenbaum, J. (1976). *Computer Power and Human Reason.* San Francisco: Freeman Publishing Co.

Whiteside, J., Bennett, J., and Holtzblatt, K. (1988). Usability engineering: Our experience and evolution. In M. Helander (ed.), *Handbook of Human Computer Interaction.* New York: North-Holland.

Whiteside, J., Jones, S., Levy, P. S., and Wixon, D. (1985). User performance with command, menu and iconic interfaces. In *CHI'85, Human Factors in Computing Systems* (pp. 185–191). New York: ACM.

Wixon, D., & Jones, S. W. (1991). Usability for fun and profit: A case study of the design of DEC RALLY Version 2. Internal report. Digital Equipment Corporation.

Wright, J. W. (ed.). (1992). *The Universal Almanac.* Kansas City: Andrews and McMeel.

Ziegler, J. E., and Fahnrich, K. P. (1988). Direct manipulation. In M. Helander (ed.), *Handbook of Human Computer Interaction.* New York: North-Holland.

Zuboff, S. (1988). *In the Age of the Smart Machine.* New York: Basic Books.

Zuboff, S. (1991). Debate: Can research reinvent the corporation? *Harvard Business Review* (March–April), 164–165.

Index