

Joel D. Goldhar

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Professor of Operations and Technology Management

Stuart Graduate School of Business
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Education

D.B.A. George Washington University, Washington, D.C., 1971

Emphasis on Technology Management, General Management, Business Strategy, Operations Management, and the Process of Technological Innovation. Minor concentration in Public Administration. Dissertation: "An Exploratory Study of Technological Innovation."

M.B.A. Harvard Business School, Boston, MA, 1965

Concentration in managerial economics and general management. Minor concentration in marketing. Food Fair Foundation Fellowship and New York State Regents Fellowship for Advanced Graduate Study.

B.Ch.E Rensselaer Polytechnic Institute, Troy, NY, 1963

Concentration in chemical engineering and chemistry. Minor concentration in economics.
Commissioned as 2nd Lt., USAR.

Professional History

Summer-2005 Adjunct Professor, Kellogg Graduate School of Management.
Taught course on Small Business Management.

1982-present Professor of Operations and Technology Management, Stuart School of Business, Illinois Institute of Technology, Chicago, Illinois.

Teach courses in Operations and Technology Management, Operations Policy and Strategy, Marketing, e-Commerce, New Product Development. Business

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Policy, Competitive Analysis, Organizational Theory and Design and The Management of Technology and Innovation. Ongoing Research interests in the integration of strategy, structure, operations and technology; Business Unit Level Strategies; New Product Development; and the use of Advanced Manufacturing Technology to create strategic flexibility and competitive advantage. More recent interest in Small Enterprise Management; 'weak links' in the Supply Chain, Services vs. Manufacturing Operations and the Role of the COO.

- 1994-2001 Program Director: MS in Operations and Technology Management; a lock step weekend program for experienced managers.
- 1982-1988 Dean, Stuart School of Business, Illinois Institute of Technology, Chicago, Illinois. Refocused school to a technology management emphasis; reversed enrollment declines; developed funding for research; and created a strong external image for the program.
- 1980-1982 Executive Director, Manufacturing Studies Board, National Research Council, National Academy of Sciences, Washington, DC. Responsible for the planning, organization and direction of a variety of public policy studies and advisory activities in the general area of manufacturing and productivity. Supervised small professional staff, developed proposals for support and coordinated efforts of volunteer experts.
- 1981-1982 Executive Secretary, Committee on Computational Mechanics, National Research Council, National Academy of Sciences, Washington, DC.
- 1978-1981 Executive Secretary, Committee on Computer-Aided Manufacturing, National Research Council, National Academy of Sciences, Washington, DC.
- 1973-1978 Program Director for User Requirements and Economics of Information, Division of Science Information Services, National Science Foundation, Washington, DC.
- Directed a grants program designed to support research and experimentation on the use of innovative scientific and technical information services. Supervised staff of five professionals with a budget of \$2.5 million. Responsibility for managing program development, budgeting, supervision of research in progress, and transfer of results to use.
- 1970-1973 Assistant Professor of Management, Rensselaer Polytechnic Institute of Connecticut, Hartford, CT.
- Taught courses in marketing, production, and strategic management. Conducted research in technology transfer and innovation, technology assessment,

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technology and society relationships; and corporate planning in an environment of changing technology.

1968-1970 United States Army, Active Duty

Assigned to the Industrial College of the Armed Forces as Special Projects Officer and Member of the Faculty. Variety of research, teaching and administrative duties. Awarded Joint Service Commendation Medal, June 1970. Reserve duty as Mobilization Designee in Systems Analysis and Review Office, Department of the Army. Released from Reserve obligations in 1986 with rank of Major and Honorable Discharge.

1966-1967 Instructor in Management, Northeastern University, Boston, MA

Taught graduate and undergraduate courses in manufacturing policy, managerial economics, business policy, and production/operations management.

1965-1968 Research Assistant and Research Associate, Harvard Business School, Boston, MA

Wrote case studies based on field research for the courses Manufacturing Policy, and General Management (Executive Development Program) with an emphasis on long range planning.

1967-1982 Various Adjunct or Visiting positions, at the following: American University, Washington DC; Wharton School of Business, Philadelphia; Nova University, Fort Lauderdale; The Hartford Graduate Center, Hartford, CT; Clark University, Worcester, MA; University of California, Los Angeles; Columbia University Graduate School of Business, New York.

Taught graduate courses in R&D Management, Science and Public Policy, Production Management, Marketing, Manufacturing Policy, Organizational Behavior, Industrial Marketing, Management of Technological Innovation, and Manufacturing Policy and Strategy.

Academic Concentrations and Research Interests

The impact of information technology on manufacturing and service operations and business strategy.

The effects of automation on scientific and engineering creativity.

Organization and Strategy for technology based businesses.

The integration of R&D, marketing and production for operational effectiveness.

The integration of strategy, structure, operations and technology.

Weak links in the supply chain.

Design of service operations.

Role of the Chief Operating Office.

Contributions to Teaching

Developing courses and programs that integrate functional fields of study within a framework of business strategy.

Extensive use of case method and Computer Simulations/Games.

Revision of the JD/MBA Program to achieve greater integration of intellectual content.

Citations in the Professional Literature (as of July 2006): **813**

Intellectual Contributions

Basic Scholarship

With Daniel Berg, "Blurring the Boundary: Convergence of Factory and Service Processes", *Journal of Manufacturing Technology Management*, Vol. 21 No. 3, 2010

With Stonebraker and Nassos, "Weak Links in the Supply Chain", *Journal of Manufacturing Technology Management*, Vol.20 No.2, 2009

With Daniel Berg, "The Convergence of Factory and Service Operations in the 21st Century: Directions for Research and Education", *Intl. J. Service Technology and Management* Vol.11, No. 3, 2009

With Daniel Berg, "Defining Services in the 21st Century: Directions for Research and Education", Production and Operations Management Society: Annual Meeting, Dallas, Texas (May 5, 2007).

With Daniel Berg and Yale Braunstein, "Services Innovation in the 21st Century: It All Begins with Defining Services vs. Products and Factory vs. Service Operations", UC-Berkeley Conference on Service Innovation, April 26, 2007.

With Daniel Berg "Defining Services". IBM Conference on Service, System Management, Engineering (SSSME), Palisades, N.Y. Oct 5-7, 2006.

With Mei Xue, "Service Operations Strategy" POMS Annual Meeting, Chicago, 2005.

Joel Goldhar, The Convergence of Manufacturing and Service Operations Conference of the POMS College of Service Operations, New York, 2004.

With David Lei, "Knowledge and Organizational Properties of CIM Technology".

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International Journal of Manufacturing Technology and Management, a special series of International Journal of Technology Management, Vol. 4, Nos 1/2, pp. 134-157, 2002

With Paul Prabhaker. "The Impact of Manufacturing Flexibility Upon Marketing Strategies", International Journal of Technology Management, Vol. 3, Nos 1/2, 2001

With David Lei and Michael Hitt. "Advanced Manufacturing Technology: Organization Design and Strategic Flexibility". Organization Studies, Vol 17/3, 1996.

With David Lei. "Variety is Free: Manufacturing in the Twenty-First Century". Academy of Management Executive, Vol. 9, No. 4, 1995.

With Theodore W. Schlie. "Advanced Manufacturing and New Direction for Competitive Strategy". Journal of Business Research 33, pp. 103-114, 1995. Elsevier Science, Inc., 1995.

With Paul R. Prabhaker and David Lei. "Marketing Implications of Newer Manufacturing Technologies". Journal of Business & Industrial Marketing, Vol. 10, No.2, 1995.

With David Lei. "Organizing and Managing the CIM/FMS Firm for Maximum Competitive Advantage". Int. J. Technology Management, Special Issue on Technological Responses to Increasing Competition, Vol. 9, Nos. 5/6/7, pp. 709-732, 1994.

With Paul R. Prabhaker and David Lei. "Marketing Implications of Flexible Manufacturing Systems". American Marketing Association, winter 1994. Published in The Proceedings.

With David Lei. "Implementation of CIM Technology: The Key Role of Organizational Learning." The International Journal of Human Factors In Manufacturing, Vol. 3 (3) 217-230, 1993.

With Mariann Jelinek and Theodore W. Schlie. "Flexibility and Competitive Advantage - Manufacturing Becomes A Service Business". International Journal Technology Management, Special Issue on Manufacturing Strategy, Vol. 6, Nos. 3/4, pp. 243-259, 1991.

With Mariann Jelinek and Theodore W. Schlie. "Competitive Advantage in Manufacturing Through Information Technology." International Journal of Technology Management, Special publication on the Role of Technology in Corporate Policy, Guest Editor, Bela Gold. Geneva, Switzerland: Interscience Enterprises, LTD., 1991.

With David Lei. "Multiple Niche Competition: The Strategic Use of CIM Technology." Manufacturing Review, Vol. 3, No. 3, September 1990.

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With Mariann Jelinek and Theodore W. Schlie. "Flexibility and Competitive Advantage - Manufacturing Becomes A Service Business." Paper presented at UK/OMA 1990, June 26-27, Warwick, England.

With Mariann Jelinek. "Manufacturing as a Service Business: CIM in the 21st Century." Computers in Industry, Vol. 14, No. 1-3, 1990.

With A.T. Talaysum and M.Z. Hassan. "Uncertainty Reduction Through Flexible Manufacturing." IEEE Transactions on Engineering Management, Vol. EM-34, No. 2, May 1987.

"Evolution in Manufacturing-The Inevitability of Strategic Impacts of CIM." Paper presented at CAPE '86, Copenhagen, May 1986. Published in proceedings.

With Adil Talaysum and M. Zia Hassan. "Scale vs. Scope: Considerations in the CIM/FMS Factory." In Flexible Manufacturing Systems: Methods and Studies. Edited by Andrew Kusiak. North Holland, 1986.

With Mariann Jelinek. "Plan for Economies of Scope." Harvard Business Review, November-December, 1983. Reprint in Strategic Planning Comes of Age, edited by Harvard Business Review. New York: Harper & Row, 1986.

With Adil Talaysum and M. Zia Hassan. "Scale vs. Scope: The Long-Run Economics of the CIM/FMS Factory." Paper presented at the AMPS COMPCONTROL 85 Meeting, Budapest, Hungary, August 1985.

With Adil Talaysum and M. Zia Hassan. "Economies of Scope, Product Differentiation and Capacity Planning in the CIM/FMS Factory." Paper presented at the Symposium on Economies of Scope, European Institute of Advanced Studies in Management, Brussels, Belgium, June 1985.

With Mariann Jelinek. "The Strategic Implications of the Factory of the Future." Sloan Management Review, summer, 1984, Vol.25, No 4. Reprinted in The McKinsey Quarterly, Autumn, 1985.

With Mariann Jelinek. "Computer Integrated Flexible Manufacturing Systems: Organizational, Economic and Strategic Implications." Interfaces 15, May-June, 1985, pp. 94-105.

With D. Burnham. "Changing Concepts of the Manufacturing System." In U.S. Leadership in

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Manufacturing, Washington DC: National Academy of Engineering, pp. 92-104, 1982.

With Yoram Wind and John Grashof. "Market-based Guidelines for the Design of Industrial Products." Journal of Marketing, April, 1978

With Jules Schwartz and Thomas J. Gambino. "Are Innovators in Chemistry Different?" CHEMTEC, July 1976, pp. 418-421.

With Jules Schwartz and Louis Bragaw. "Information Flows, Management Styles and Technological Innovation." In IEEE Proceedings on Engineering Management, 1976.

"Information, Idea Generation and Technological Innovation." Paper presented at the NATO Advanced Study Institute on Technology Transfer, Paris-Evry, France, June 15-July 17, 1973. Published in proceedings. Leiden, The Netherlands: Noordhoff International Publishing, 1973.

An Exploratory Study of Technological Innovation. D.B.A. Dissertation, Ann Arbor, Mich.: University Microfilms, 1970.

Applied Scholarship

COO Workshops, POMs Annual Meetings, Chair/Organizer and Speaker; 2004, 2005, 2006, 2007, 2008

With Paul Prabhaker. "Technology-Driven Product-Life-Cycles: Their Impact on Business Metrics." Presented at IEMS Conference, March 1998.

With Paul Prabhaker; "Effects of Flexible Manufacturing Technology on Consumer Choices". Presented at IEMS Conference, March 1997, Cocoa Beach, Florida.

With Paul Prabhaker and David Lei. "Marketing Implications of Flexible Manufacturing Systems." Presented at Educators' Conference, American Marketing Association, February 1994

"Business Strategies For The 21st Century Manufacturing Firm - Using CIM For Competitive Advantage." In Autofact '92 Conference Proceedings, Society of Manufacturing Engineers; Dearborne, Michigan, 1992, p. 8-19 to 8-57. Presented at Autofact '92, November 10-12, 1992, Detroit, Michigan.

"Computer Integrated Manufacturing: Redefining The Manufacturing Firm Into A Global Service Business." International Journal of Operations and Production Management, November, 1991.

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“Competitive Issues In Electronics Manufacturing.” Paper presented at EM/SME Roundtable, November 1991, Chicago, IL.

With Jelinek, M. “Economics in the Factory of the Future.” Integrated Production Systems: Design, Planning, Control, and Scheduling, 4th Edition, edited by V.A. Mabert and F.R. Jacobs. Norcross, GA: Industrial Engineering and Management Press, 1991, pp. 127-141. (Reprinted)

With Theodore Schlie. “The Manufacturing World of Tomorrow: New Directions for Competitive Strategy.” Paper presented at AAAS, February 16, 1991.

With Theodore Schlie. “Computer Technology and International Competition: Part 2: Managing the Factory of the Future to Achieve Competitive Advantage.” Integrated Manufacturing Systems, MCB University Press, Vol. 2, No. 2, 1991.

With David Lei. “The Multiple Niche Competitors - A Strategic Use of FMS and CIM.” Paper presented at Autofact '91.

With Theodore Schlie. “Computer Technology and International Competition: Part I: The Factory of the Future.” Integrated Manufacturing Systems, MCB University Press, Vol. 2, No. 1, 1991.

With David Lei. “The Shape of Twenty-first Century Global Manufacturing.” The Journal Of Business Strategy, March/April, 1991.

With David Lei. “The Impact of Flexible Manufacturing and Design Systems/Technology on Product Innovation and Technology Transfer.” Paper presented at ORSA/TIMS, Philadelphia, PA, October 29-31, 1990.

With Theodore W. Schlie. “Competitive Strategy for Manufacturing Firms.” Paper presented at POM '90, October 14-17, 1990, Washington, DC.

“A Service Approach to Manufacturing: Business Strategy for the Age of CIM.” Paper presented at IMTS, Chicago, IL, September 10, 1990.

With David Lei. “International Manufacturing and the 21st Century.” Industry Forum, American Management Association, September, 1990.

With Theodore W. Schlie. “CIM & Competitive Advantage.” Strategic Direction, May, 1990, Zurich Switzerland.

With Theodore W. Schlie. “CIM & Competitive Advantage.” Technology Strategies, May, 1990, Zurich Switzerland.

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With Theodore W. Schlie. "Using CIM for Competitive Advantage: Counter-Intuitive Business Strategies for CIM Based Firms." Paper presented at Manufacturing International, ASME, March 25-28, 1990, Atlanta, GA. Published in The Proceedings.

With Mariann Jelinek. "Strategic Management in the 21st Century: The Role of CIM." Chapter 12 in Strategic Management: Methods and Studies, edited by Burton V. Dean and John Cassidy. New York: North Holland Press, 1990.

"The Implications of CIM for International Manufacturing." Managing International Manufacturing, edited by K. Ferdows. Elsevier Science Publishers, 1989.

"The Strategic Impacts of CIM Technology: Manufacturing Becomes a Service Business." Paper presented at the National Communications Forum, Chicago, IL, October 2-4, 1989.

With Theodore W. Schlie. "Variety, Complexity, and Timeliness: CIM Based Business Strategies." Paper presented at Autofact '89, Detroit, MI, October 30-November 1, 1989.

With Mariann Jelinek. "Strategic Management in the 21st Century: The Role of CIM Technology." In Innovation at The Crossroads Between Science and Technology, edited by Kranzberg, Elkana and Tadmor. Technion City, Haifa, Israel: The S. Neuman Press, 1989.

"Manufacturing Flexibility For Competitive Advantage...The Strategic Imperative For CIM: Advanced Materials In Manufacturing Revolution." Proceedings of the Conference held at Argonne National Laboratory, June 14, 1988. Edited by Michael V. Nevitt & Norman D. Peterson, February 1989.

With Theodore W. Schlie. "Product Variety and Time Based Manufacturing/Business Management: Achieving Competitive Advantage Through CIM." Manufacturing Review, March 1989.

With Theodore W. Schlie. "Managing the CIM Factory of the Future for Strategic Competitive Advantage (Part II)." Strategic Planning Management, Vol. 6, No. 1, 1988.

With Theodore W. Schlie. "Managing the CIM Factory of the Future for Strategic Competitive Advantage (Part I)." Strategic Planning Management, Vol. 6, No. 1, 1988.

With Theodore W. Schlie. "Advanced Technology, International Competition-Forces Driving the Factory of the Future." Strategic Planning Management, Vol. 5, No. 11, 1988.

"Science and Technology: The Basis for Global Competitiveness." Fermilab Industrial Affiliates Roundtable on The Science-Technology Spiral and The Pace of Progress, Fermilab, May 1988.

"Complex Can Be Competitive." Interview by Stephen MacAulay, Production, April 1988,

pp. 74-75.

With Mariann Jelinek. "Strategic Management in the 21st Century: Government and the Role of CIM Technology." In Harvard International Review 10:2, January 1988.

With Mariann Jelinek. "A New World of Manufacturing: Strategic and Organizational Implications of Advanced Manufacturing Techniques." Proceedings of The Institute of Management Sciences, 1987.

"Counter Intuitive Business Strategies." Paper presented at Autofact '87, Detroit, MI, November 1987. Summarized in Manufacturing Engineering, March 1988, p. 17.

"Counter Intuitive Business Strategies...Ideas for Using CIM as a Competitive Weapon in Global Markets", Luncheon address presented at ASME Manufacturing International '87, Detroit, MI, November 9-12, 1987.

"The Paradox of Innovation vs. Productivity." Paper presented at the National Communications Forum, Chicago, IL, September 29, 1987. Published in The Proceedings.

"International Manufacturing and business Strategy...Ideas for Using CIM as a Competitive Weapon in Global Markets." Paper presented at INSEAD Symposium, Fontainebleau, France, September 7-9, 1987. Published in The Proceedings.

"The Future of Illinois Manufacturing." Paper presented at The 15th Annual Conference of the Illinois Department of Energy and Natural Resources, Rosemont, IL, September 3 and 4, 1986. Published in proceedings.

With Mariann Jelinek. "Maximizing Strategic Opportunities in Implementing Advanced Manufacturing Systems." In Managing Technological Innovation. Edited by Donald Davis. San Francisco: Josey-Bass, 1986.

"In the Factory of the Future, Innovation is Productivity." Research Management, March-April, 1986, Vol. XXIX, No. 2.

With Mariann Jelinek. "Economics in the Factory of the Future." CIM Review, Vol. 2, No. 2, Winter, 1986.

"Regaining our Competitive Edge." Interview in Chief Executive, No. 34, winter, 1985-1986, pp. 32-37.

"The Transparent Factory." CIM Magazine, March/April, 1985.

With Adil Talaysum. "Needed Revisions in Traditional Operations Management Concepts

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and Tools to Harness CIM.” Paper presented at ORSA TIMS 1985 Annual Meeting, Boston, MA, April, 1985.

With Adil Talaysum. “An Overview of CIM’s Impact on Business Strategy.” Paper presented at Society of Manufacturing Engineering’s CIMCON 85 Meeting, Anaheim, CA, April, 1985.

With Mariann Jelinek. “A Whole New World of Manufacturing.” Paper presented at the First International Symposium of the Eastern Academy of Management, Tilberg, The Netherlands, June 1985. Published in proceedings.

With Mariann Jelinek. “A New World of Manufacturing: Strategic and Organizational Implications of Advanced Manufacturing Techniques.” Paper presented at the Strategic Management Society Annual Meeting, Barcelona, Spain, October 1985.

With D. Burnham. “Changing Concepts of the Manufacturing System.” In U.S. Leadership in Manufacturing, Washington DC: National Academy of Engineering, pp. 92-104, 1982.

With Mariann Jelinek. “Economies of Scope: The Strategic Impact.” Presented at the Annual Meeting of the American Association for the Advancement of Science, New York, May, 1984.

“The Corporate Strategy and Capital Budgeting Implications of Computer-Integrated Manufacturing.” Presented at SME CIMCOM Conference, Washington, DC, March 15, 1984. Published in proceedings.

“Characteristics of New Concept Factories.” Manufacturing: New Concepts and New Technology, A Conference Report from the Conference Board Meeting, May 11-12, 1983, New York. Published in proceedings.

With Mariann Jelinek. “Manufacturing Technology and Corporate Strategy: Critical Interface for the 1980s.” Columbia Journal of World Business, Spring, 1983.

“Some Summary Thoughts.” In Manufacturing Productivity Solutions III Proceedings, Society of Manufacturing Engineers, November 15-16, 1982.

“Lessons for New Product Innovators.” UCLA Graduate School of Management Magazine, Vol. 1, No. 3, Spring, 1982.

“The Marketing and Corporate Strategy Implications of CAD/CAM.” Paper presented at the

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Business Week Executive Conference, Leadership in the New Information Era, New York, NY, January 23, 1981.

With H. Guyford Stever. "Needed Cure for Lagging Productivity." Manufacturing Engineering, July 1980.

"An Agenda for the Future." Chapter 13 in Marketing Scientific and Technical Information, edited by William R. King and Gerald Zaltman. Boulder, CO: Westview Press, 1979.

"STI Dissemination: Issues and Opportunities." Chapter 2 in Marketing Scientific and Technical Information, edited by William R. King and Gerald Zaltman. Boulder, CO: Westview Press, 1979.

"Innovation Decision Making in Large Organizations." Paper presented at the Innovation and Anti-Trust Law Colloquium, New York Bar Association, December 29, 1979.

With Yoram Wind. "The Marketing-R&D Interface." Paper presented at TIMS, Atlanta, GA, November 1977.

With Carole Ganz. "The Impact of Telecommunications Technologies on Informal Communication in Science and Engineering-Research Needs and Opportunities." Paper presented at NATO Telecommunications Symposium, Bergamo, Italy, September 1977. Published in proceedings.

"Obtaining the Using Information for Research and Engineering in the Year 2000." IEEE Transactions on Professional Communications, 1977.

With Carole Ganz. "The Myth of the National Information Plan." In Proceedings of the ASIS Annual Meeting, 1976.

With Carole Ganz. "The Role of Scientific Communication in the Process of Technological Innovation." Information, October 1975.

Technology Transfer. NATO Advanced Study Institute Series. Edited by Davidson, Cetron and Goldhar. Leiden, The Netherlands: Noordhoff International Publishing, 1974.

"The Process of Technology Innovation." Paper presented at the Panel on Stimulation of Technology by Government, AAAS Meeting, Washington, DC, December 28, 1972.

"The Dimensions of R&D Activity." Chapter in The Science of Managing Organized Technology, edited by Cetron and Goldhar. New York: Gordon and Breach Science Publishers Inc., 1970.

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With M. Cetron. "The Science of Managing Organized Technology." IEEE Transactions on Engineering Management. EM-17 no. 1, 1970.

Instructional Development

Teaching the course in Small Enterprise Management, POMS Boston 2006

With Philip H. Francis, Winfred M. Phillips, Marvin F. DeVries, James E. A. John, and Eugene I. Rivin. "The Academic Preparation of Manufacturing Engineers: A Blueprint for Change." Manufacturing Review, Vol. 1, No. 3, October 1988, pp. 158-163.

With Mariann Jelinek. "Manufacturing Technology and Corporate Strategy: Critical Interface for the 1980s." In Readings in The Management of Innovation, 2nd Ed., edited by Michael L. Tushman & William L. Moore. Ballinger Publishing Company, 1988.

With Martin L. Bariff. "Implications of Computer Integrated Manufacturing for Corporate Strategy, Capital Budgeting and Information Management." Chapter in Languages for Automation, edited by S.K. Chang. New York: Plemun Publishing Corporation, 1985.

Edited with Burton V. Dean. Research and Development Management: A Critical Review. TIMS Special Study Series, North Holland Press, 1981.

With Daniel J. Fink. "A Management Bibliography for Physicians." Annual of Internal Medicine, February 1980.

"Manufacturing Technology Trends: The Electronic Factory." Executive Briefing in A Business Approach to Manufacturing Systems, by Booz, Allen and Hamilton, May 31, 1979.

"Introduction to the Plastics Industry." Chapter in Environment Effects on Polymeric Materials, edited by Rosato and Schwartz. New York: John Wiley and Sons, 1967.

Patents Granted

No: US 6, 757,828 B1, June 29, 2004 with J. Jaffe and M. Warot, Indigenous Authentication for Sensor-Recorders and Other Information Capture Devices. (Also Received Japan Patent)

Intellectual Development/Continuing Education

Regular attendance at professional meetings, short courses, trade shows and seminars.

Professional Activities

Associate Editor and Manuscript Reviewer (at various times) for:

IEEE Transactions

Omega

JAM

AME

Manufacturing Review

Journal of Manufacturing Systems

Administration and University Service (Multiple tours at various times)

Member, COCOPT

Member, UCOPT

Member, Faculty Council

Member, Academic Freedom and Tenure Committee

Member, Finance Committee

Founding Director, MS/OTM Program

Professional Societies (at Various Times)

Fellow, American Association for the Advancement of Science.

American Economic Association.

Academy of Management.

The Institute of Management Sciences

Associate Editor, Research and Development Department, Management Sciences.

Sigma Xi.

Women's Equity Action League.

Member, Board of Trustees

Society of Manufacturing Engineers

Society for the History of Technology

Editorial Board, IEEE Transactions on Engineering Management

Editorial Board, Computers in Industry

Editorial Board, Journal of Manufacturing Systems

Editorial Board, Manufacturing Review

American Management Association; Member, Technology, Innovation and Manufacturing Management Council.

National Research Council; Service on a variety of ad hoc boards and committees.

Civic and Community Activities

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Duman Micro Enterprise Loan Fund/Jewish Vocational Services: Member, Loan Approval Committee.

Board of Directors, Junior Achievement of Chicago (1985-1995).

Economic Club of Chicago.

Cosmos Club, Washington DC.

Union League Club, Chicago.

Wide variety of talks and speeches at professional and technical meetings.