Edmund William Schuster

Citizenship: American
Birth: Lorain, Ohio - St. Joseph's Hospital
Hometown: Avon Lake, Ohio (Lorain County)

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                   Avon Lake, Ohio 44012
                   email: edmund_w@schuster.us.com

Web Site: http://schuster.us.com/

Summary

- Executive with over 40 years of experience in academic administration, research, corporate management, publishing, startups, and consulting.
- Skill and practice in remote work (gig economy). Five years of project experience with Upwork, Inc. (53 clients), Top Rated.
- Current research and industry focus – a) Mathematical Models, b) Computing Semantics (M Language), and c) Materials Science (biomaterials).
- Co-Founder - MIT Field Intelligence Lab and the MIT Data Center Program.
- Administrator for $800k budget with GS1 involving Auto-ID Labs.
- Author of Global RFID, published by Springer.
- Specialist in logistics, supply chain, and operations management.
- Ability in management, technology innovation, Asia, strategic planning, agriculture, and natural resources.
- Published author in peer reviewed journals (2,334 citations) with advanced research, writing, and presentation skills.
- Publisher, FABRIC FOR DISPERSED KNOWLEDGE ™; 12,700 posts since Fall 2006. Focus is on technology, engineering, supply chain, macroeconomics, and financial markets.
- Expert in modeling languages, and Object Management Group standards.
- Leader in setting up standards for government statistics and data.
- LinkedIn - 28,000 followers.

Intellectual Property

1. Spatial Autocorrelation and the Identification of Subtle Structure in Raster Imaging Data, USDA Docket No. 0013.15.

2. Modified Dixon-Sliver Heuristic (MODS), MIT TLO Case No. 13645.

3. Lee-Schuster Semantic Enterprise Architecture, MIT TLO Case No. 13745.

4. Kratulos, MIT TLO Case No. 13752.

5. The M Language Web Site, MIT TLO Case No. 13110.

Trademarks

6. The Chatbot Supply Chain™

7. Fabric for Dispersed Knowledge™

8. Data Spawn™

9. Edm. Biomaterials™, Edm. Systemaitcs™, and Edm. Intelligencer™

10. Spatial Design of Experiments™ and SDOE™ (shared with Milliken and Willers)

11. Jefferization™ (shared with Milliken and Willers)

12. AggregationZY™

13. Derived Knowledge™ (USA only)

14. "The Forge and the First Light: Avon Lake and the Ohio frontier that cast the Midwest (1632 – 1965)." © 2022 Edmund W. Schuster

15. The Logo (2012):

16. 1454.io™

17. Edmund W. Schuster™

18. What do the Machines Think? ™

Software Expertise

- Matlab (including machine learning)

- Mendeley and research tools
- Microsoft Office 365, Apple, and Google
  - Presentation, word processing, spreadsheet, notes, operating system
  - AdSense, Google Analytics
- Adobe
  - Creative Cloud Suite
- ARCTIS (Archaeological Toolbox for Imaging Spectroscopy)
- VMware
- Business Factoring (Riviera Finance)
- iPhone Productivity Apps
  - Quip
  - TimeTracker
  - IFTTT
  - Many others (I use over 440 apps)

Education

Master of Public Administration (MPA) - Management Science, 1987
>   Gannon University - Erie, PA

Bachelor of Science (BS) - Food Technology, 1980
>   The Ohio State University - Columbus, OH

Professional Education

Multi-scale Materials Design, 2015
>   Massachusetts Institute of Technology

Executive Development Program, 1988
>   The University of Tennessee – Knoxville, TN

Social Networking

LinkedIn   https://www.linkedin.com/in/edmundwschuster/
Medium   https://medium.com/@Dispersed_Knowl
Blogger   https://ingehygd.blogspot.com/
Facebook https://www.facebook.com/edmund.w.schuster
Quora   https://www.quora.com/profile/Edmund-W-Schuster

Twitter   https://twitter.com/dispersed_knowl

Google
Scholar   https://scholar.google.com/citations?user=FK0h_VkAAAAJ&hl=en

History of Employment

Massachusetts Institute of Technology
Cambridge, MA (23 years)

Short-term Lecturer, 2016 - Current
Professional Studies Program
School of Engineering

- "Agriculture, Innovation, and the Environment" (Program Co-director)

Research Affiliate, 2014 – 2020
Institute for Medical Engineering and Science
School of Engineering

- Industrial applications of silk – Laboratory for Advanced Biopolymers.

Research Affiliate, 2013 - 2014
Langer Research Laboratory
David H. Koch Institute for Integrative Cancer Research

- Research and industrial application of biomaterials.

Research Engineer and Associate Director - Administration, 2007 – 2012
Auto-ID Lab and Field Intelligence Lab
Laboratory for Manufacturing and Productivity / Dept. of Mechanical Engineering

Research Engineer and Co-Director Administration, 2003 – 2009
The MIT Data Center Program
Laboratory for Manufacturing and Productivity / Dept. of Mechanical Engineering

Research Consultant, 2002 – 2005
MIT Auto-ID Center & Auto-ID Labs
Laboratory for Manufacturing and Productivity / Dept. of Mechanical Engineering

Director, Affiliates Program in Logistics, 2000 – 2002
Center for Transportation and Logistics
Engineering Systems Division / Dept. of Civil Engineering

- Built and managed an industrial consortium of 35 companies with focus on logistics, supply chain, and transportation; total budget of $700 k.

- Planned and executed an annual program of seminars, forums, and executive courses for the Affiliates (7 - 8 programs per year) in areas such as dynamic pricing, spare parts inventory management, customer service and global logistics.

- Recruited first Asian Affiliate, Tata Steel of India; delivered invited lectures in Bangkok and Singapore for the MIT Industrial Liaison Program.

- Initiated, designed, directed and participated in custom two-day seminars for Lockheed Martin, EDS, VW, and Unilever.

- Delivered 1.5-day seminar titled "Supply Chain Management: Innovations and Trends" in Taipei and Tokyo plus several presentations to alumni groups.

- Co-initiated new research in Supply Chain Security. Produced and edited an audio library for the Center Web Site featuring leading thinking about supply chain security after the attack of 9/11. Organized a broadcast on the topic as part of NPR radio program, "Marketplace."

- Co-initiated first case study research in supply chain applications for Auto-ID technology (Gillette), leading a team of three graduate students. Co-authored several articles on this technology.

- Researched, developed and applied new method for harvest modeling involving mathematical optimization of joint probability functions with extensions to short product life cycle inventory management.

- Leading a team, researched and developed an innovative method to improve master production schedule stability. Practical application realized.

- Supervised 11 thesis students in two years. Six are pursuing Ph.D. and professional graduate degrees at MIT, Harvard University, Cambridge University, Ohio State, and Northwestern University. Others are working for Exxon and Silicon Storage Technologies, YCH Group in Singapore, Marubeni Corporation in Japan and MIT.

E. W. Schuster Macro Industries LLC (self employed)
Avon Lake, Ohio and Nashua, NH (17 years)

Instituter, 2012 – current

Publisher, FABRIC FOR DISPERSED KNOWLEDGE™, Fall 2006 – current

Projects – USDA (precision agriculture), Advanced Potash Technology, University of Florida, BASF.

53 Clients on Upwork, a wide range of consulting and research projects. Top Rated.

Highlights

- Agile project management – research and analysis.
- Research in actuarial science and artificial intelligence / machine learning.
- Copywriting – website.
- Digital analytics, search engine optimization, event data modeling.
- Project-based learning.
- Last mile – freight consolidation facility in urban area.
- Operations research – airline crew pairing problem.
- Cascade-correlation Neural Networks (CCNN).
- Human resource recruiting strategy for a large credit union.
- Feasibility of five acre solar farms in NH.
- Engineering comprehensive clean energy system – Australia.
- Davis – Bacon Act. – book.
- Spatial analysis and econometric modeling.
- Precision agriculture.
- Research in labor economics and productivity.
- Food safety and artificial intelligence.
- Research in the gig economy (collaborative consumption).
- Research in materials science, including corrosion.
- Artificial intelligence and machine learning (several projects).
- Editing academic manuscripts for publication.
- Genetic Algorithms and the Traveling Salesman Problem.
- Reliability of the Elecrtical Grid.
- Fluid Mechanics of Ocean Waves.
- The Effect of the Internet on Inflation.
- Government Data Sharing Research.
- Cyrptocurrency Research.
- Blockchain research.

ReadyTouch, Inc.
Palo Alto, CA (13 years)

Shareholder, 2004 – 2017

Welch's, Inc., Corporate Headquarters
Concord, MA (18 years)

Corporate Manager of Operations Planning, 1999
　　　Supply Chain Department

Corporate Manager of Logistics Planning, 1993 - 1998
　　　Logistics Department

- Led team that planned and controlled Welch's largest asset worth $84 million. Also, led multi-function team that contributed $8 million to the bottom line by reducing inventory. Developed the Juice Logistics Model to aid in rational decision-making.

- Served as member of strategic planning team with mission of streamlining the supply chain. Made recommendations that totaled $5 million in savings and sparked merger talks with a West coast juice company.

- Co-developed the "harvest planning" model that optimizes the assets employed in receiving and storing grapes resulting in a cost avoidance of $2 million dollars in capital spending.

- Established the "Continuous Replenishment Planning" program where the vendor manages the re-supply of customers through electronic data exchange. Supervised two analysts who operated the replenishment system for four major customers including Welch's largest customer, Wal-Mart.

- Designed planning segments for Welch's ERP system (Prism by Marcam Corporation). Implemented advanced planning system and developed education programs for materials requirements planning as part of corporate re-engineering team.

- Conducted ongoing analysis of the manufacturing network using math-modeling software: determined new plant locations, re-configured shipping territories, assigned plant production and plant shutdowns. Savings from the projects equaled $0.5 million.

- Created "capacitated MRP" using auxiliary models to supplement the ERP system.

Supervisor - Production and Inventory Analysis, 1988 - 1993
Corporate Logistics Department - Westfield, NY

Oversaw the inventory management system for grape juice and crop storage planning across all plants. Supervised co-packing of aseptic juice and variety packs. Established the kosher program for all Welch's products.

Inventory Analyst, 1982 - 1987
Corporate Physical Distribution Department - Westfield, NY

Controlled inventory for corporate wide packed product and supplies worth $20 million. Designed inventory planning model and targeting system based on statistical expression of customer service. Promoted to this position from production and cook room supervisor at Welch's largest plant, 1981 - 1982.

Oscar Mayer, Chef's Pantry Division
Sandusky, OH (1 year)

Sanitation and Cook Room Supervisor, 1980 - 1981

Supervised plant sanitation and production of cooked processed meats in a union environment. Managed and coordinated the activities of 15 - 20 employees.

History of Prior University Employment

Adjunct Faculty, Metropolitan College, 1988
Gannon University – Erie, Pennsylvania

Lecturer in Management Science, School of Business, 1990 - 1993
Penn State Behrend – Erie, Pennsylvania

Consulting Experience

Lockheed Martin, Unilever, Estee Lauder, Monsanto, Lillian Vernon, Syngenta, Morgan Franklin Corporation, Roche, Del Monte Pacific, Iotatoi, USDA, 26 Celsius, BASF, Advanced Potash Technology, Mod6 (insect farming), Precision Planting (AGCO).

Company Visits, Talks & Seminars – the MIT Industrial Liaison Program

NEC, Dai Nippon Printing, Fujitsu, Ishikawajima Heavy Industries, Hitachi, Quantum Computer, Taiwan Semiconductor, LG, Korean MOST, Epoch Foundation, Berli Junker Public Company, China Development Bank, Veriken, Sany Heavy Industries, Bunge, Deere & Co., Alstom Transportation Service, CSX, Cisco, Energizer-Schick, Foxcon, The Gillette Co. (Proctor & Gamble), Huawei Technologies Co., J&J, Northrop Grumman Corp., Philip Morris Intl., Sanofi Aventis, Schlumberger, Sumitomo, Taiwan Stock Exchange, Tata Steel, Toshiba, Volkswagen, Yuen Foong Yu Paper Mfg. Co. (YFY), Hyundai Heavy Industries.

Leadership Positions in Learned Societies and Government

Co-chair and Committee Member – Object Management Group, Statistics WG, (2020 – current).

Committee Member – Object Management Group, Federated Enterprise Risk Management WG, (2019 - 2020).

Committee Member – Object Management Group, Government DTF, (2019 – current).

Review Panel Member - USDA Food and Agriculture Cyberinformatics and Tools Program - FACT, (2019).

Review Board Member, Comprehensive Automation for Specialty Crops, USDA Specialty Crop Research Initiative project with Carnegie Mellon University: Washington, D.C. (2009 – 2012).

Publicity Chair & Program Committee, Internet of Things 2012: Wuxi, China (Oct. 2012).

Track Chair – Inventory, Annual Global Conference, Council for Supply Chain Management Professionals: Philadelphia, PA (Oct. 2011).

Publication Chair & Program Committee, Internet of Things 2010: Tokyo, Japan (Nov. 2010).

Organizing Committee & Supply Chain Lead, Regional Food Systems – USDA/University Consortium, Washington, D.C. (2008 -2010).
> Members – MIT Field Intelligence Lab, Tufts University, Iowa State University, Penn State University, USDA – Agricultural Research Service, USDA – Agricultural Marketing Service, USDA – Economic Research Service

Organizing Committee, Application of Precision Agriculture for Fruits and Vegetables, International Society for Horticultural Science: Orlando, FL (Jan. 2008).

Specialty Crops Engineering Solutions Working Group, United States Department of Agriculture (2007 – 2009).
> -- Web site design subcommittee
> -- List of technologies subcommittee
> -- Specialty crop agriculture, white paper subcommittee
> -- Literature review subcommittee
> -- Technology subcommittee

Vice President – Special Projects, Nashua Chapter of the American Production and Inventory Control Society (APICS, 2003 - current).

National Steering Committee, Process Industry Specific Industry Group of APICS (2000 - 2003).

National Chair, Process Industry Specific Interest Group of APICS (1998 & 1999).

Program Chair, The Process Industry Technical Conference - Breaking Through Capacity Constraints (1999).

Program Chair, The Process Industry Technical Conference - Supply Chain Integration: Turing Information into Profits (1998).

Program Chair, The Process Industry Technical Conference - Implementing Applied Operations Research in Supply Chain Management (1997).

Program Chair, The Process Industry Technical Conference - Looking Toward the 21st Century (1996).

Co - Chair, The Process Industry Technical Conference - Optimal Solutions to Dynamic Problems (1995).

Co - Chair, The Process Industry Technical Conference - Solving Today's Problems with Tomorrow's Technology (1994).

Academic Liaison, Process Industry Specific Industry Group of APICS (1993 - 1996).

Co - Founder and Associate Director, Center for Process Manufacturing (1991 - 1999).

National Chair, Process Industry Specific Industry Group of APICS (1989 & 1990).

National Steering Committee, Process Industry Specific Industry Group of APICS (1987-1988).

President, Erie Chapter of APICS (1987-1988).

Director - Process Industry Specific Industry Group, Erie Chapter of APICS (1985-1987).

Professional Association Membership (Apr. 1982 – 2017)

Council for Supply Chain Management Professionals (CSCMP)

Institute for Operations Research and Management Science (INFORMS)

The American Production and Inventory Control Society (APICS)

Institute of Food Technology

Professional Certification

CFPIM (1986 – 2000) and CIRM; both from APICS

Research Awards

2. Best Paper 2010, *International Journal of Operations Research and Information Systems*

1. 2004 E. Grosvenor Plowman Award given by the *Council for Supply Chain Management Professionals* for best paper ($1,000).

Research Interests

Agricultural Systems Productivity, Nanomaterials for Agriculture, The Asian Megalopolis, Marketing Spatial Diffusion, Data Interoperability, M Language, Web Machines, Semantic Modeling, Auto-ID Technology, Harvest Risk, Lot Sizing for Short Life-Cycle Products, The Practice of Modeling, Supply Chain Risk, Comparative Logistics Systems (Asia vs. USA), Capacitated Material Requirements Planning Systems (CMRP), Process Industry Manufacturing Planning and Control Systems, Logistics Planning Systems and Large Scale Math Programming, Visualization and Optimization, Computer Simulation and Modeling, Location Science, Optimal Control Theory, The Internet of Things, Economics – Productivity and Interoperability plus Collaborative Consumption, artificial intelligence and machine learning, GenAI, government statistics and standards, labor market analysis.

Books

1. Schuster, E.W., S. J. Allen, and D.L. Brock, GLOBAL RFID: THE VALUE OF THE EPCGLOBAL NETWORK FOR SUPPLY CHAIN MANAGEMENT, Berlin: Springer (2007).

Chapters

3. Lee, H-G, E.W. Schuster, S.J. Allen, P. Kar, "The Open System for Master Production Scheduling: Information Technology for Semantic Connections between Data and Mathematical Models," in INNOVATIONS IN INFORMATION SYSTEMS FOR BUSINESS FUNCTIONALITY AND OPERATIONS MANAGEMENT, Edited by J. Wang, Hershey, Pennsylvania: IGI Global (2012).

2. Willers, J., D. Roberts, C. O'Hara, G. Milliken, K. Hood, J. Walters, E.W. Schuster, "The Illuminating Role of Laser Scanning Digital Elevation Models in Precision Agriculture Experimental Designs – An Agro-Ecology Perspective," in LASTER SCANNER TECHNOLOGY, Edited by J. Apolinar Munoz Rodriguez, Croatia: InTech (2012).

1. Schuster, E.W., D. L. Brock, S. J. Allen, P. Kar, and M. Dinning. "Enabling ERP through Auto-ID Technology." In STRATEGIC ERP EXTENSION AND USE. Edited by F. Robert Jacobs and Elliot Bendoly, Palo Alto: Stanford University Press (2005).

Refereed Journal Publications

15. Willers, J.L., P.E. English, E.W. Schuster, S. Samiappan, and K.B Hood, "Spatial autocorrelation and the identification of subtle structure in raster imaging data imaging bit-planes," Precision Agriculture, under review.

14. Khot, L.R., S. Sankaran, J.M. Maja, R. Ehsani, E.W. Schuster, "Applications of nanomaterials in agricultural production and crop protection: a review," *Crop Protection* 35 (2012), pp. 64 – 70.

13. Schuster, E.W., H-G Lee, R. Ehsani, S.J. Allen, J.S. Rogers, "Machine-to-machine communication for agricultural systems: an xml-based auxiliary language to enhance semantic interoperability," *Computers and Electronics in Agriculture* 76, no. 2 (2011), pp. 150 – 161.

12. Lee, H-G, E.W. Schuster, S.J. Allen, P. Kar, "The open system for master production scheduling: information technology for semantic connections between data and mathematical models," *International Journal of Operations Research and Information Systems* 1, no. 1 (2010), pp. 1 – 15.

11. Schuster, E.W., S.J. Allen, H.G. Lee, and C. Unahabhokha, "Master production schedule stability under conditions of finite capacity," under second review, *International Journal of Applied Management Science (2010)*.

10. Brock, D.L., E.W. Schuster, S.J. Allen, and P. Kar, "An introduction to semantic modeling for logistical systems," *Journal of Business Logistics* 26, no. 2 (2005), pp. 97 – 117.

9. Allen, S.J. and E.W. Schuster, "Controlling the risk for an agricultural harvest," *Manufacturing & Service Operations Management* 6, no. 3 (2004): pp. 225 – 236.

8. Allen, S.J. and E.W. Schuster, "Managing the risk for the grape harvest at Welch's," *Production and Inventory Management Journal* 41, no. 3 (2000): pp. 31 – 36.

7. Schuster, E.W., S.J. Allen and M.P. D'Itri, "Capacitated materials requirements planning and its application in the process industries," *Journal of Business Logistics* 21, no. 1 (2000): pp. 169 – 189.

6. D'Itri, M.P., S.J. Allen and E.W. Schuster, "Capacitated scheduling of multiple products on a single processor with sequence dependencies," *Production and Inventory Management Journal* 40, no. 4 (1999): pp. 27 – 33.

5. Schuster, E.W. and S.J. Allen, "Raw material management at Welch's," *Interfaces* 28, no. 5 (1998): pp. 13 - 24.

4. Allen, S.J., J. Martin, and E.W. Schuster, "A simple method for the multi-Item, single level, capacitated scheduling problem with set-up times and costs," *Production and Inventory Management Journal* 38, no. 4 (1997): pp. 39 - 47.

3. Allen, S.J. and E.W. Schuster, "Practical production scheduling with capacity constraints and dynamic demand: family planning and disaggregation*," Production and Inventory Management Journal* 35, no. 4 (1994): pp. 15 - 21.

2. Schuster, E.W. and B.J. Finch, "A deterministic spreadsheet simulation model for production scheduling in a lumpy demand environment," Production and Inventory Management Journal 31, no. 1 (1990): pp. 39 - 42.

1. Canella, T and E.W. Schuster, "Simulating warehousing costs: a spreadsheet application," *Production and Inventory Management Journal 28*, no. 4 (1987): pp. 1 - 5.

Refereed Conference Proceedings

23. Schuster, E.W., S. Kumar, S.E. Sarma, J.L. Willers, G.A. Milliken, "Infrastructure for data-driven agriculture: identifying management zones for cotton using statistical modeling and machine learning techniques," *Emerging Technologies for a Smarter World (CEWIT): 8th International Conference & Expo*: Long Island, New York (November 2011).
IEEE Conference Publications

22. Schuster, E.W., "Agricultural supply chains: track and trace for improved food safety," *Application of Precision Agriculture for Fruits and Vegetables*, International Society for Horticultural Science: Orlando, FL (January 2008).

21. Schuster, E.W., "Global supply chain management and the chinese megalopolis," *Japan-China Organization for Business, Academic & Government Partnership* (August 2007).
This article was published in Japanese

20. Rogers, J.S., H.N. Nigg, I. Clark, D.S. Hart, R. Ehsani, D.L. Brock and E.W. Schuster, "Internet – pda based survey and modeling systems for agricultural insects and diseases: Integrated fruit-fly, citrus canker, and greening surveys," *Florida State Horticultural Society Annual Meeting* (June 2006).

19. Schuster, E.W., "Auto-ID technology," *Proceedings of the APICS 47th International Conference*: San Diego, CA (2004).

18. Brock, D.L., E.W. Schuster, S.J. Allen and P. Kar, "An introduction to semantic modeling for logistical systems," *Proceedings of the 33rd Annual Logistics Educators Conference*: Philadelphia, PA (2004).
(This paper won the E. Grosvenor Plowman Award)

17. Li, M, P. Kar and E.W. Schuster, "A case study of computer service parts inventory management," *Proceedings of the Remanufacturing Special Industry Group of APICS* (2003).

16. Schuster, E.W. and K. Watanabe, "The impact of e-commerce on the Japanese raw fish supply chain," *Proceedings of the 32nd Annual Logistics Educators Conference* (2003).

15. Koh, R., E.W. Schuster, I. Chackrabarti, and A. Bellman, "Securing the pharmaceutical supply chain," *MIT Auto-ID Center*, Cambridge, MA (2003).

14. Koh, R., E.W. Schuster and N.S. Lam, "Prediction, detection and proof: An integrated Auto-ID solution to theft," *MIT Auto-ID Center,* Cambridge, MA (2003).

13. Schuster, E.W. and S.J. Allen, "Finite planning models through computer animation," *Proceedings of the APICS 42nd International Conference*: New Orleans, LA (1999), pp. 263 - 267.

12. Schuster, E.W. and S.J. Allen, "Visualization and finite capacity planning in the process industries," *Proceedings of the 41st APICS International Conference*: Nashville, TN (1998), pp. 118 - 122.

11. Schuster, E.W. and S.J. Allen, "Managing raw materials inventories using capacitated MRP at Welch's," *Proceedings of the Council of Logistics Annual Conference*: Anaheim, CA (1998), pp. 389 - 400.

10. Schuster, E.W. and S.J. Allen, "Capacitated mrp in the process industries: practice and theory in consumer goods manufacturing," *Proceedings of the 40th APICS International Conference*: Washington D.C. (1997), pp. 407 - 412.

9. Schuster, E.W., M.P. D'Itri, and S.J. Allen, "Improved supply chain management through mathematical modeling: a process industry case study," *Proceedings of the 39th APICS International Conference*: New Orleans (1996), pp. 355 - 362.

8. Schuster, E.W., and S.J. Allen, "A new framework for production planning in the process industries," *Proceedings of the 38th APICS International Conference*: Orlando, FL (1995), pp. 31 - 35.

7. Martin, J., S.J. Allen and E.W. Schuster. ``Capacity planning in the process industry.'' *Proceedings of the National Conference of the Decision Sciences Institute*, Honolulu, HI (1994), pp. 1663-1665.

6. Schuster, E.W., and S.J. Allen, "Production planning and scheduling in the process industries using optimal solution methods," *Proceedings of the Congress for Progress*: Hershey, PA (1994), pp. 68 - 81.

5. Allen, S.J., and E.W. Schuster, "Applied hierarchical planning with dynamic inventory buffers*," Proceedings of the APICS Process Industry Symposium*: Cincinnati, OH (1993), pp. 7 - 15.

4. Schuster, E.W., and S.J. Allen, "Plant location planning and analysis in the process industries," *Proceedings of the APICS Process Industry Symposium*: Chicago, IL (1992), pp. 83 - 86.

3. Schuster, E.W., "Simulating warehouse costs in process oriented manufacturing," *Proceedings of the 1990 APICS Process Industry Symposium*: Baltimore, MD (1990), pp. 125 - 127.

2. Schuster, E.W., "A tutorial on JIT manufacturing," *Proceedings of the Council of Logistics Management Conference*: St. Louis (1989).

1. Schuster, E.W., "A logistics application of simulation to determine distribution costs resulting from a forward warehouse operation," *Proceedings of the Winter Simulation Conference*: Atlanta, GA (1987), pp. 845 - 852.

Other Significant Publications

93. Schuster, E.W., "The microeconomics of artificial intelligence," Medium (forthcoming – October 2023).

93. Schuster, E.W., "… the financial system is due for a serious reckoning," Medium (February 1, 2023).

92. Schuster, E.W., "The 2023 Compass for supply chain research," Medium (January 19, 2023).

91. Schuster, E.W., "The upcoming battle for american agricultural land," Medium (August 22, 2022).

90. Schuster, E.W., "Barron's, university learning, industry, and math modeling," Medium (July19, 2022).

89. Schuster, E.W., "The summer of '22 and electrical shortages," Medium (June 13, 2022).

88. Schuster, E.W., "The anti upheaval in the tech industry," Medium (April 5, 2021).

87. Schuster, E.W., "An evanescent history of American food safety," Medium (August 31, 2020).

86. Schuster, E.W., "The uses of government data in society," Medium (August 1, 2020).

85. Schuster, E.W., "Bit-plane slicing for discovery," Medium (July 11, 2020).

84. Schuster, E.W., "The united states economy and technical efficiency," Medium (June 21, 2020).

83. Schuster, E.W., "Electronic data growth and total factor productivity," Medium (June 19, 2020).

82. Schuster, E.W., "Smart data," Medium (June 14, 2020).

81. Schuster, E.W., "The lancet," Medium (June 5, 2020).

79. Schuster, E.W., "Precision agriculture," Medium (June 4, 2020).

80. Schuster, E.W., "Model and data fusion," Medium (May 31, 2020).

78. Schuster, E.W., "Responsive architecture," Medium (May 30, 2020).

77. Schuster, E.W., "Semantic distance," Medium (May 27, 2020).

76. Schuster, E.W., "The usda grant review process," Medium (May 24, 2020).

75. Schuster, E.W., "The baconian mindset," Medium (May 23, 2020).

74. Schuster, E.W., "Upsurge in the inventory to sales ratio," Medium (May 17, 2020).

73. Schuster, E.W., "Headship from the light," Medium (May 15, 2020).

72. Schuster, E.W., "The birth of just-in-time manufacturing," Medium (May 13, 2020).

71. Schuster, E.W., "The digital industry beliefs," Medium (May 12, 2020).

70. Schuster, E.W., "At the frontier of all things digital," Medium (May 12, 2020).

69. Schuster, E.W., "The web of abstractions," Medium (May 11, 2020).

68. Schuster, E.W., "My trip in china – august 2007," Medium (May 9, 2020).

67. Schuster, E.W., "Controversy and the minimum wage," Medium (May 1, 2020).

66. Schuster, E.W., "Airbnb, innovation, and collaborative consumption," Medium (April 30, 2020).

65. Schuster, E.W., "My trip in china – June 2011," Medium (April 29, 2020).

64. Schuster, E.W., "The american job market woes," Medium (April 18, 2020).

63. Schuster, E.W., "The water wars," Medium (September 8, 2019).

62. Schuster, E.W., "Productivity and spatial variability," Medium (September 2, 2019).

61. Schuster, E.W., "The foundations of food technology," Medium (September 3, 2018).

60. Schuster, E.W., "The future of crop protection: bactericides or heat treatments?" Medium (August 28, 2018).

59. Schuster, E.W., "Combat in the orange groves," Medium (August 4, 2018).

58. Schuster, E.W., "Citrus greening: an alarming plant disease and an opportunity for research," Medium (May 11, 2018).

57. Schuster, E.W., "American frontierism," Medium (March 7, 2018).

56. Schuster, E.W., "The developers, apple, and its apps," Medium (December 16, 2017).

55. Schuster, E.W., "Stuart J. Allen," Medium (July 20, 2017).

54. Schuster, E.W. and C. Senatore, "Automated vehicles: the leading edge of cyber – physical systems," Medium (July 12, 2017).

53. Schuster, E.W., "Derived knowledge: the next frontier for internet search," Medium (July 9, 2017).

52. Schuster, E.W., "Cyber-physical systems," Medium (June 29, 2017).

51. Schuster, E.W., "Engineering, Miniaturization, and History," Medium (June 29, 2017).

50. Schuster, E.W., "The Future of Financial Services Data Standards," Medium (April 21, 2017).

49. Schuster, E.W., "Induction and the ontology," Medium (April 20, 2017).

48. Schuster, E.W., "Industry practice: Is everything a pattern?" Medium (April 18, 2017).

47. Schuster, E.W., "The future of financial services data standards," *The Shield* 3, (2013), pp. 18 – 19.

46. Schuster, E.W. and H-G Lee, "Mobile computing, spatial intelligence, and interoperability for agricultural field data," *Cutter IT Journal* 23, no. 9 (2010), pp. 28 – 34.

45. Lee, H-G and E.W. Schuster, "Intranet architecture for the semantic enterprise." *Cutter IT Journal* 22, no. 9 (2009), pp. 31 – 37.

44. Schuster, E.W., "Specialty crop research," Summary of the April USDA Workshop, Self - Published (January 2008).

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23. Schuster, E.W., "Auto-ID technology: creating an intelligent infrastructure for business," *Business Intelligence Report* 5, no. 9 (2005). (Published by the Cutter Consortium: Arlington, MA)

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12. Schuster, E.W. and R. Koh, "To track and trace," *APICS – The Performance Advantage* (2004), MULTI-PART COVER STORY.

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Newsletter Articles

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26. Schuster, E.W., "FDA, counterfeit, and RFID technology," Published as the *Article of the Day,* The MIT Data Center (2004).

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16. Schuster, E.W., "A gift from Isaac Newton*," The Integrator* (January 1993).

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1. Schuster, E.W., "Microcomputer simulation of production scheduling: a Welch Foods case study," 1986 *Erie APICS Report* (September 1985).

Blog (finance, economics, and technology)

FABRIC FOR DISPERSED KNOWLEDGE™ ingehygd.blogspot.com, 2006 – current
I have written 12,700 posts.

Thesis Supervision for Meng in Logistics (MIT)

2000 – 2001 Academic Year

"The Characteristics of e-Commerce in Japan."
Kazunari Watanabe, MLog01
Employment - MBA Student, Kellogg School of Management, Northwestern University
"Delivery Cost and Online Retailing."

I-Han Chen, MLog01
Employment - Industrial Engineer, Silicon Storage Technology

"Purchasing Optimization: A Case Study."
Tom Albertson, MLog01
Employment - Sourcing Specialist, ExxonMobil Global Services Company

2001 – 2002 Academic Year

Auto-ID Technology – Gillette Case Study (Dahmen, Dinning and Lam)

"An Exploration of Product Diversion in the Consumer Goods Supply Chain."
Joseph Dahmen, MLog02
Employment – MBA student, Sloan School of Management, MIT

"Applications of Auto-ID Technology to Gain Supply Chain Process Efficiencies in the Consumer Packaged Goods Industry."
Mark Dinning, MLog02
Employment – Research Assistant, Auto-ID Center, MIT

"A Study of the Impact of Auto-ID on Shrinkage within the Fast Moving Consumer Goods Supply Chain."
Nhat-So Lam, MLog02
Employment – MBA student, Sloan School of Management, MIT

"An Exploration of Distribution Network Design for Computer Service Companies."
Ming Li, MLog02
Employment – Teaching Assistant, MIT

"Logistics System Design for a Chinese Home Appliance Manufacturer --A Case Study of TCL Holding Corporation."
Ping Wang, MLog02
Employment – Ph.D. candidate at the Ohio State University

"Understanding the Organic Foods Supply Chain – Challenges and Opportunities from Farm Gate to End Consumer."
Mary Chang, MLog02
Employment – Financial Management, Greenwich, CT

"Stability of the Master Production Schedule under Conditions of Finite Capacity."
Chatchai Unahabhokha, MLog02
Employment – Ph.D. candidate at the University of Cambridge

"An Exploratory Comparative Study of Third Party Logistics Providers
in USA and Singapore."
Kuang Yuan Ler, MLog02
Employment - Head of the Managing Director's Office, YCH Group, Singapore

2002 – 2003 Academic Year, co-supervised with D.W. Engels and R. Koh

"Product Traceability in the Pharmaceutical Supply Chain: An Analysis of the Auto-ID Approach."
Attilio Bellman, MLog03

"An Auto-ID Based Approach to Reduce Counterfeiting in the U.S. Pharmaceutical Supply Chain."
Indy Chakrabarti, MLog03

"An Analysis of the Department of Defense Supply Chain: Potential Applications of the Auto-ID Center Technology to Improve Effectiveness."
Elaine M. Lai, Bachelor of Science in Mechanical Engineering '03

2005 – 2006 Academic Year

"Risk in Agriculture - A Study of Crop Yield Distributions and Crop Insurance"
Narsi Reddy Gayam, MLog06

2006 – 2007 Academic Year

"Managing Risk in Premium Fruit and Vegetable Supply Chains"
Joshua Matthew Merrill, MLog07

Ph.D Thesis Collaboration

2008
"Coverage Problems in Mobile Sensing"
Ajay Deshpande – Dept. of Mechanical Engineering, MIT

2012
"Low-cost, Passive UHF RFID Tag Antenna-Based Sensors for Pervasive Sensor Applications"
Rahul Bhattacharyya – Dept. of Mechanical Engineering, MIT

2013
"Mobile Sensor Networks for Field Estimation and Hot Spot Identification"
Sumeet Kumar – Dept. of Mechanical Engineering, MIT

Seminars Conducted

15. Schuster, E.W., "Global supply chain management and the chinese megalopolis," *Executive MBA Program*, Beijing Jiatong University: Beijing, China (June 2008).

14. Schuster, E.W., "Introduction to the mit field intelligence lab and drop sensing," *MIT Industrial Liaison Seminar*: Tokyo, Japan (June 2008)

13. Schuster, E.W., "The open system for master production scheduling," *Epoch Foundation*: Taipei, Taiwan (June 2008).

12. Schuster, E.W., "Auto-ID and related technologies: The Data-Driven Economy," *Seminar1*: Hartford, CT (April 2006).

11. Schuster, E.W. "Auto-ID and ERP" & "Track, trace, and authentication," Auto-ID Labs Educational Seminars (July 2004, December 2004, February 2005).

10. Schuster, E.W. and D.L. Brock, "Auto-ID and The Data Center: Creating an intelligent infrastructure for business," *APICS St. Louis Chapter* (October 20, 2004).

9. Schuster, E.W., "Auto-ID: The first intelligent value chain, parts I and II" *The 2004 APICS International Conference*: San Diego (2004).

8. Schuster, E.W., "The future with Auto-ID technology," *APICS Webinar Series* (July 14, 2004).

7. Schuster, E.W., "Auto-ID technology," *Region I APICS Meeting* (Spring 2004).

6. Schuster, E.W., "Supply chain management: Innovations and trends," *MIT Industrial Liaison Program*, Taipei and Tokyo (April 2002).

5. Schuster, E.W. and S.J. Allen, "The real meaning of finite scheduling: a practical approach to production planning in the process industries," *The Process Industry Technical Conference*: Erie, Pennsylvania (June 1994).

4. Schuster, E.W., "Simulation of production and inventory control systems," *Jamestown Community College/Small Business Development Center*: Jamestown, New York (March 1990).

3. Schuster, E.W., "Process industries seminar - closed loop overview and top management planning section*," APICS/PI-SIG*: San Francisco, CA (November 1989).

2. Schuster, E.W., "New horizons in small business inventory management," *Gannon University/Small Business Development Center*: Erie, Pennsylvania (September 1989).

1. Schuster, E.W., "Basic inventory systems and control for manufacturing," *Jamestown Community College/Small Business Development Center*: Jamestown, New York (March 1989).

Speeches – Professional Societies

97. Schuster, E.W., "The industrial internet," Granite State Chapter, APICS: Portsmouth, NH (September 16, 2014).

96. Schuster, E.W., "Big data is a big reality," *GS1 Connect 2012*: Las Vegas, NV (June 4 – 7, 2012).

95. Schuster, E.W., "Tag antenna-based sensing," *Granite State Chapter, APICS*: Portsmouth, NH (January 17, 2012).

94. Schuster, E.W., "Innovation and the future – track and trace systems," *Institute for Food Technology – Open Input, Food Tracing Study*: Chicago, IL (November 2, 2011).

93. Schuster, E.W., "Master production schedule stability under conditions of finite capacity," *APICS – The Association for Operations Management*: Boston, MA (September 13, 2011).

92. Schuster, E.W. (web cast), "Machine-to-machine communication for agricultural systems: an xml-based auxiliary language to enhance semantic interoperability," *Asia Pacific Advanced Network*: Hong Kong (February 21 – 25, 2011).

91. Schuster, E.W., "Internet computing for bio-productivity," *Beltwide Cotton Conference*: Atlanta, GA (January 3-6, 2011).

90. Schuster, E.W., "Machine-to-machine communication for agricultural systems: an xml-based auxiliary language to enhance semantic interoperability," *CompSust 2010 – Massachusetts Institute of Technology*: Cambridge, MA (June 30, 2010).

89. Schuster, E.W., "Auto-ID labs update," *U Connect 2010*: San Antonio, TX (June 7 – 10, 2010).

88. Schuster, E.W., "Passive rfid sensing," *Seminar1*: Boston, MA (April 27, 2010).

87. Schuster, E.W., "MIT auto-id lab," *MIT Alumni Association*, Rollins College: Orlando, FL (April 13, 2010).

86. Schuster, E.W., H-G Lee, "Activities in ubiquitous computing," *Seminar1*: Boston, MA (April, 26, 2009).

85. Schuster, E.W., "The open system for master production scheduling," *Granite State Chapter – APICS*: Portsmouth, NH (October 21, 2008).

84. Lee, H-G., E.W. Schuster, and Stuart J. Allen, "Biased adjusted safety stock method for open system master production scheduling," *INFORMS*: Washington D.C. (October 12 – 15, 2008).

83. Schuster, E.W., H.G. Lee, and Stuart J. Allen, "The open system for master production scheduling: information technology for semantic connections between data and mathematical models," *Seminar1*: Boston (April 29, 2008).

82. Schuster, E.W., Stuart J. Allen, and H.G. Lee, "Improved new product forecasting through visualization of spatial diffusion," *Seminar1*: Boston (April 28, 2008).

81. Schuster, E.W., "Specialty crop engineering working group: research program activities at mit," *Presented to the USDA*: Washington, D.C. (February 8, 2008).

80. Schuster, E.W., "Agricultural supply chains: track and trace for improved food safety," *Application of Precision Agriculture for Fruits and Vegetables*, International Society for Horticultural Science: Orlando, FL (January 7, 2008).

79. Panchapakesan, R., R. Ehsani, E.W. Schuster, M. Hirafuji, "Integration of wireless mesh sensor networks and m language for applications in agriculture, *Poster - Application of Precision Agriculture for Fruits and Vegetables,* International Society for Horticultural Science: Orlando, FL (January 7, 2008).

78. Schuster, E.W., "Harvest risk: an introduction to quantitative modeling and optimization in agriculture," *INFORMS Annual Meeting*: Seattle, WA (November 6, 2007).

77. Schuster, E.W., "Information technology for agricultural Systems productivity," *Poster - 2007 International Photonics, Food, & Agriculture Conference*: Canandaigua, NY (November 16, 2007).

76. Schuster, E.W., "Global supply chain management and the chinese megalopolis," *Japan-China Organization for Business, Academic & Government Partnership*: Nanjing, China (August 22, 2007).

75. Schuster, E.W., "The data-driven economy: applications of the m language in agriculture," *Specialty Crops Seminar*: Washington D.C. (April 2007).

74. Schuster, E.W., "Track and trace in the pharmaceutical supply chain," APICS Portland Chapter (March 2007).

73. Schuster, E.W. "The data-driven economy: applications of the m language in Manufacturing and Supply Chain Management," *APICS Worcester County Chapter* (October 2006).

72. Schuster, E.W., "The data-driven economy," *2006 Northeast Supply Chain Conference & Exhibition* – Marlborough Massachusetts (October 2006).

71. Schuster, E.W., "Auto-ID and related technologies," *2006 Shanghai China Conference sponsored* by the Council for Supply Chain Management Professionals – Shanghai (August 2006).

70. Schuster, E.W., "Auto-ID and related technologies," APICS Portland Chapter (February 2006).

69. Schuster, E.W., "Auto-ID and related technologies," *APICS Seacoast Chapter* (January 18, 2005).

68. Schuster, E.W., "Finite capacity planning and scheduling," *St. Louis APICS Chapter* (October 19, 2004).

67. Schuster, E.W., "Auto-ID technology," *APICS Southern Tier Chapter* (September 15, 2004).

66. Schuster, E.W., "Auto-ID and ERP," *Frontline: Chicago*, IL (2004).

65. Schuster, E.W., "Auto-ID technology," *APICS St. Louis Chapter* (Spring 2004).

64. Schuster, E.W., "Auto-ID technology," *APICS Northern New Jersey* Chapter (2004).

63. Schuster, E.W., "Auto-ID technology," *APICS Southern New Hampshire Chapter* (January 2004).

62. Schuster, E. W. and K. Watanabe, "The Impact of e-Commerce on the Japanese raw fish supply chain," *The Logistics Educators' Conference*: Chicago, IL (2003).

61. Schuster, E.W. and R. Koh, "Prediction, detection and proof: An integrated Auto-ID solution to theft." *Auto-ID Center Applications Group Meeting*: Zurich (June 2003).

60. Koh, R. (presenter) and E.W. Schuster, "Securing the pharmaceutical supply chain," *Auto-ID Center Applications Group Meeting*: Zurich (2003).

59. Schuster, E.W. (presenter) and S.J. Allen, "Prosperity, work and survival in the new economy," *The Southern New Hampshire Chapter of APICS*: Nashua, NH (September 2000).

58. Schuster, E.W. (presenter) and S.J. Allen, "Capacitated MRP and its application in the process industries," *IBM Supply Chain Management Executive Conference*: Las Vegas, NV (March 2000).

57. Schuster, E.W. (presenter) and S.J. Allen, "Prosperity, work and survival in the new economy," *First Annual PSU Symposium*: Erie, PA (March 2000).

56. Schuster, E.W. (presenter) and S.J. Allen, "Supply chain decision – making using mathematical models at Welch's," *Process Forum 2000 - Solutions for Food, Beverage and Consumer Packaged Goods Industries*: Baltimore, MD (February 2000).

55. Schuster, E.W. (presenter) and S.J. Allen, "Supply chain dynamics and network planning at Welch's, Inc.," *The Champlain Valley Vermont Chapter of APICS*: Burlington, VT (September 1999).

54. Schuster, E.W. (presenter) and S.J. Allen, "Managing raw material procurement risk at Welch's, Inc.," *The Process Industries Technical Conference*: Erie, PA (June 1999).

53. Schuster, E.W. (presenter) and S.J. Allen, "Visualization and finite capacity planning in the process industries*," The APICS International Conference*: Nashville, TN (October 1998).

52. Allen, S.J. (presenter), M.P. D'Itri and E.W. Schuster, "Capacitated scheduling of multiple products on a single Processor with sequence dependencies," *INFORMS*: Seattle, WA (October 1998).

51. Schuster, E.W. (presenter) and S.J. Allen, "Managing raw material inventories using capacitated MRP at Welch's, Inc.," *The Annual Council of Logistics Management Conference*: Anaheim, CA (October 1998).

50. Schuster, E.W., "Supply chain dynamics and network planning at Welch's, Inc.," *The Southern New Hampshire Chapter of APICS*: Nashua, NH (September 1998).

49. Schuster, E.W., "Issues facing the process industries," The Process Industry Technical Conference: Erie, PA (June 1998).

48. Allen, S.J. and E.W. Schuster, "The harvest model: managing risk in raw material procurement," *The Process Industry Technical Conference*: Erie, PA (June 1998).

47. Allen, S.J (presenter), J. Martin and E.W. Schuster, "A heuristic for multi-item, capacitated scheduling with set-up times and costs," *INFORMS*: Dallas, TX (October, 1997).

46. Schuster, E.W. (presenter) and S.J. Allen, "Capacitated MRP in the process industries: from theory to practice," *The Southern New Hampshire Chapter of APICS*: Nashua, NH (September 1997).

45. Schuster, E.W. (presenter) and S.J. Allen, "Capacitated MRP in the process industries: from theory to practice," *The APICS International Conference*: Washington, D.C (October 1997).

44. Schuster, E.W. (presenter) and S.J. Allen, "Capacitated MRP in the process industries: from theory to practice," *The Process Industry Technical Conference*: Erie, PA (June 1997).

43. Schuster, E.W., "Trends in process-oriented manufacturing," *The Process Industry Technical Conference*: Erie, PA (June 1997).

42. Schuster, E.W. (presenter), S.J. Allen and M.P. D'Itri, "Ideas on the analysis of complexity in the process industries," *The Process Industry Technical Conference*: Erie, PA (June 1997).

41. D'Itri, M.P. (presenter), E.W. Schuster and S.J. Allen, "Simulating the benefits of a continuous replenishment system: A case study," *The Process Industries Technical Conference*: Erie, PA (1997).

40. Schuster, E.W. (presenter) and S.J. Allen, "Supply chain management: turning information into profits*," The Erie chapter of APICS*: (April, 1997).

39. Allen, S.J. (presenter) and E.W. Schuster, "Recipe formulation at Welch's using linear programming," *INFORMS*: Atlanta, (November, 1996).

38. Schuster, E.W. (presenter), M.P. D'Itri and S.J. Allen, "Improved supply chain management through mathematical modeling: a process industries case study," *The APICS International Conference*: New Orleans, LA (October 1996).

37. Schuster, E.W. (presenter) and S.J. Allen, "Interactive learning center (ILC) – demonstration of a spreadsheet based, heuristic finite planning system for the process industries," *The APICS International Conference*: New Orleans, LA (October 1996).

36. Schuster, E.W., "Process Industries SIG moderator of the 'birds of a feather session," *The APICS International Conference*: New Orleans, LA (October 1996).

35. Schuster, E.W., "Process industries SIG panel moderator 'optimization technologies for planning and scheduling,'" *The APICS International Conference*: New Orleans, LA (October 1996).

34. Schuster, E.W. (presenter), M.P. D'Itri and S.J. Allen, "Mathematical modeling of the supply chain," *The Process Industry Technical Conference*: Erie, PA (June 1996).

33. Allen, S.J. (presenter) and E.W. Schuster, "A raw materials logistics and blending model for the food industry," *INFORMS*: New Orleans, LA (October 1995).

32. D'Itri, M.P. and E.W. Schuster, "Continuous replenishment systems in the process industries: implementation issues and ideas for productivity improvements," *The Process Industries Technical Conference*: Erie, PA (June 1995).

31. Schuster, E.W. and S.J. Allen, "The juice logistics model: an application of linear programming at Welch's, Inc.," *The Process Industries Technical Conference*: Erie, PA (June 1995).

30. Schuster, E.W. (presenter) and S.J. Allen, "A new framework for production planning in the process industries," *The APICS International Conference*: Orlando, FL (October 1995).

29. Martin, J. (presenter), S.J. Allen and E.W. Schuster, "Strategic capacity planning in the consumer goods industry: an optimal control approach," *The Decision Sciences Institute*: Hawaii (1995).

28. Schuster, E.W. (presenter for S.J.A.) and S.J. Allen, "Applied hierarchical production planning for the process industries," *ORSA/TIMS*: Detroit, MI (October 1994).

27. Schuster, E.W (presenter). and S.J. Allen, "A study of operations research issues facing the process industries*," ORSA/TIMS*: Detroit, MI (October 1994).

26. Allen, S.J. and E.W. Schuster, "Numerical results for an optimal cost model of capacity planning in the food industry," *ORSA/TIMS*: Boston, MA (April 1994).

25. Schuster, E.W. (co-presenter) and S.J. Allen (co-presenter), "Production Planning and scheduling in the process industries using optimal solution methods," *Congress for Progress XIX*: Hershey, PA (April 1994).

24. Allen, S.J. (presenter) and E.W. Schuster, "A finite capacity, hierarchical scheduling system for dedicated production lines," *ORSA/TIMS*: Phoenix, AZ (November 1993).

23. Schuster, E.W. (presenter) and S.J. Allen, "Applied hierarchical planning with dynamic inventory buffers," *The APICS Process Industries Symposium*: Cincinnati, Ohio (June 1993).

22. Allen, S.J. (presenter) and E.W. Schuster, "The application of optimal control to strategic planning," *ORSA/TIMS*: Chicago, IL (May 1993).

21. Schuster, E.W. "Perspectives on Japanese Culture," *The Rotary Club*: Jamestown, NY (March 1993).

20. Schuster, E.W., "Site location analysis*," Cleveland Consulting Associates 1992 Locate3+ User's Conference*: Cleveland, OH (October 1992).

19. Allen, S.J. (presenter) and E.W. Schuster, "A simulation investigation of a process manufacturing line," *Production and Operations Management Society*: Orlando, FL (October 1992).

18. Schuster, E.W., "Plant location planning and analysis in the process industries," *The APICS Process Industries Symposium*: Chicago, IL (June 1992).

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17. Allen, S.J. (presenter) and E.W. Schuster, "Site location and strategic planning in the process industry," Euro *TIMS Joint International Conference*: Helsinki, Finland (June 1992).

16. Schuster, E.W., "Simulating warehousing costs in process-oriented manufacturing," *The APICS Process Industry Symposium* - Baltimore, MD (June 1990).

15. Schuster, E.W. and B.J. Finch, "The application of simulation in process oriented manufacturing*," APICS Region II Conference*: Newark, NJ (June 1990).

14. Schuster, E.W., "Conflict and cooperation regarding distribution of American consumer goods in Japan," *Albany Chapter of the American Society of Public Administration 28th Annual Institute: Albany, NY* (April 1990).

13. Schuster, E.W., "The Japanese influence in American business," *Erie Chapter of the American Association of Training and Development*: Erie, PA (March 1990).

12. Schuster, E.W., "Future directions in resource management," *Erie Chapter of the National Association of Accountants*: Erie, PA (January 1990).

11. Schuster, E.W. (presenter for B.J.F.) and B.J. Finch, "Factors that affect planning and control system design in the process industries," *The Akron Chapter APICS*: Akron, OH (December 1989).

10. Schuster, E.W., "A tutorial on JIT manufacturing," *International Meeting of the Council of Logistics Management*: St. Louis, MO (October 1989).

9. Schuster, E.W and B.J. Finch, "Using P&IC spreadsheets and simulations effectively," *APICS TIP III Regional Conference*: Pittsburgh, PA (September 1989).

8. Schuster, E.W. and G.R. Smith, "Just in time: time to get ready or get out of the way," *Erie Engineering Societies Council Exposition*: Erie, Pa (February 1989).

7. Schuster, E.W., "Applying simulation in a process oriented manufacturing environment," *APICS Mid-State Chapter*: State College, PA (November 1988), and *APICS TIP II Regional Conference*: Columbus, OH (September 1988), and *APICS Buffalo Chapter*: Buffalo, NY (February 1989).

6. Schuster, E.W., "Alternative chapter programming," *Region III Chapter Officers Meeting*: Morgantown, WV (July 1988).

5. Schuster, E.W., "A logistics application of simulation to determine distribution costs resulting from a forward warehouse," *Winter Simulation Conference*: Atlanta, GA (December 1987).

4. Schuster, E.W., "Information resources available to process oriented manufacturing," *The APICS International Conference, PI-SIG session*: St. Louis, MO (October 1987), and *Erie Chapter APICS Technical Presentation*: Erie, PA (December 1987).

3. Schuster, E.W., "Panel discussion: real world forecasting," *The Buffalo Chapter APICS*: Buffalo, NY (June 1987).

2. Schuster, E.W., "Practical applications of microcomputers in production and inventory management," *Erie Chapter APICS Technical Presentation*: Erie, PA (February 1987).

1. Schuster, E.W., "Practical applications of microcomputers in a distribution environment," *Western New York Roundtable of the National Council of Physical Distribution Management*: Rochester, NY (May 1985).

Speeches - Colleges & Universities

19. Schuster, E.W., "Infrastructure for data-driven agriculture: identifying management zones for cotton using statistical modeling and machine learning techniques," *Emerging Technologies for a Smarter World (CEWIT): 8th International Conference & Expo,* The State University of New York – Stony Brook: Long Island, New York (November 2011).

18. Schuster, E.W., "Activities in ubiquitous computing," *U-Center*, Seoul National University: Seoul, South Korea (July 2008).

17. Schuster, E. W., Controlling the risk for an agricultural harvest," *Graduate School of Agriculture*, Hokkaido University: Sapporo, Japan (June 2008).

16. Schuster, E.W., "The Data-Driven Economy: Applications of the M Language in agriculture," *University of Florida Citrus Research and Education Center*: Lake Alfred, Florida (October 2006).

15. Schuster, E.W., "The Data-Driven Economy: Applications of the M Language in manufacturing and supply chain management," *University of Florida - Computer Science Department*: Gainesville, Florida (October 2006).

14. Schuster, E.W., **"**Master production schedule stability under conditions of finite capacity," *Massachusetts Institute of Technology* (May 20, 2005).

13. Schuster, E. W., "An overview of Auto-ID and related research," Rutgers University (November 15, 2004).

12. Schuster, E.W., "Auto-ID Technology," *Miami University* (Fall 2003).

11. Schuster, E.W., "Capacitated MRP and its application in the process industries," *School of Business, Penn State Erie*: Erie, PA (February 2000).

10. Schuster. E.W. (presenter) and S.J. Allen, "Capacitated materials requirements planning and its application in the process industries," *Case Western Reserve University, School of Operations Research*: Cleveland, Ohio (November 1999).

9. Schuster, E.W. "Japanese Culture*,*" *Small Business Development Center, Jamestown Community College:* Jamestown, NY (December 1992).

8. Schuster, E.W., "New frontiers in cost control," *The International Fraternity of Delta Sigma Pi, Penn State Erie:* Erie, PA (November 1992).

7. Schuster, E.W., "Dealing with lumpy demand: a simulation solution," *Tulane University Operations Management Society*: New Orleans, LA (April 1992).

6. Schuster, E.W., "Production and operations simulation at Welch's," *The International Fraternity of Alpha Kappa Psi, Gannon University*: Erie, PA (October 1991).

5. Schuster, E.W., "Careers in logistics and operations management," The *International Fraternity of Alpha Kappa Psi, Gannon University*: Erie, PA (April 1991).

4. Schuster, E.W., "Distribution of American consumer goods in Japan," *The International Fraternity of Delta Sigma Pi, Penn State Erie*: Erie, PA (September 1990).

3. Schuster, E.W., "Essentials of business communication," *Villa Maria College – Business Writing Class*: Erie, PA (July 1989).

2. Schuster, E.W., "Management information systems and competitive advantage," *Introduction to Management Information Systems, Penn State Erie*: Erie, PA (November 1987).

1. Schuster, E.W., "Planning a new product introduction," *Planning Course Gannon University*: Erie, PA (February 1987).

Editorial Activity

Reviewer – Journal of Functional Foods, manuscript – "Coacervates of whey proteins to protect and improve the oral delivery of a bioactive molecule," (2018)

Reviewer for ioT2010 & 2012

Reviewer for CAIA2010

Springer Verlag – Series Editor, *The Data-Driven Economy (concept stage)*

Institute for Electrical and Electronic Engineers (IEEE)

Editor and Publisher, *The MIT Data Center* Web Site.

Editorial Review Board of the *Production and Inventory Management Journal*, Invited reviewer: 1999 – 2001.

Editorial Review Board of the *Journal of Operations Management*, 1989 & 1990. Co-Editor of the 1988 & 1989 *Erie APICS Report*.

Reviewer for *Process Flow Scheduling: A Scheduling Systems Framework for Flow Manufacturing,* by Steve Bolander and Sam Taylor.

Reviewer for the "Advanced Scheduling Seminar" presented by APICS.

University Courses Taught

Gannon University, 1988

Just in Time Manufacturing: The New Standard of Excellence (with G.R. Smith)

Penn State - Behrend, 1990 - 1993

Business Logistics Management 301

Course Bulletin Description - Management of logistics function in the firm, including physical supply and distribution activities such as transportation, storage, facility location, and materials handling. (I taught this course for four semesters)

Operations Management 301

Course Bulletin Description - Decision making and analysis of major management problems that arise in the operations function of business firms. (I taught this course for three semesters)

Quantitative Business Analysis 201

Course Bulletin Description- Introduction to quantitative methods for conceptualizing business and management problems. (I taught this course for 2 semesters)

Awards (Business)

MEMBER OF THE YEAR (Erie Chapter of the American Production and Inventory Control Society) - *Awarded by the Erie Engineering Societies Council*: 1989.

SILVER CIRCLE AWARD 1988, Erie Chapter, APICS Chapter Management Program.

Business/Academic Projects (Welch's 1990 – 1993)

1. Faculty in Residence Program

2. Development of an Expert System for Customer Service (SUNY, Buffalo)

3. Case Study - Planning and Control System with B.J. Finch (U. of Georgia)

4. Logistics Performance Measurement Analysis (Penn State)

Undergraduate Awards and Activity

Attended the *International Exposition for Food Processors*: St. Louis, MO (1980).

Student member of the *Institute of Food Technology* (1977-1980).

Student Member of the *American Society of Agricultural Engineers* (1976-77).

Floor President, Norton House (1977-78).

Orientation Assistant, Norton House (1977).

Intramural Sports, Football & Basketball (1976-78).

Most Improved Student, College of Agriculture (1976).