

Sabbatical Leave Report
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Overview

The major purpose of my sabbatical was to shift focus from manufacturing operations management to service operations management related research.

Summary of Research Projects

Health care – this continues to be an area where access to data and information is limited. A case study paper was presented at a conference. Because of cost pressures placed on hospitals and the rapidly changing information technology requirements like electronic medical records, there is an opportunity for process improvements and cost reductions through business modeling. Four projects have been secured for fall 2007 for graduate level research in operations management.

Universities and colleges – outsourcing of non-core operations is an attractive research area. Preliminary research in this area suggests that limited work in operations management has been done. Past studies have focused primarily on descriptive statistics with no business modeling or understanding of relationships. Work is ongoing with colleagues in this area.

Alternative fuels – ongoing research proposals and opportunities with engineering are continuing. Primary emphasis is on business/cost modeling and financial/economic feasibility.

Conferences Attended

One of the conferences, Health Information Management Systems Society (HIMSS), in New Orleans, LA was not attended because in February 2007, three days of flights were cancelled from Houghton. I will be attending the next HIMSS conference in February 2008.

Sloan Industry Studies Conference, MIT, Boston, MA, April 25-27, 2007. Attended the conference to network for possible research collaborations since most of my research is industry based. Met two possible researchers in the area of health care.

Production and Operations Management Society Conference, Dallas, TX, May 4-7, 2007, attended the Education Committee meeting, presented a 90 minute workshop, chaired a session, gave a 20 minute research presentation, and attended multiple research presentations.

Michigan Society of American Foresters, May 8-9, 2007, biomass resources utilization. Attended to continue research in alternative energy using biomass based technologies.

Decision Sciences Institute Mini Conference on Service Science, Carnegie Mellon, Pittsburgh, PA, May 24-26, 2007, presented a paper on Service Systems Engineering and attended a number of sessions.

Publications Submitted and Status

REFEREED JOURNALS

- Johnson, D.M., Sun, J., Johnson, M.A. (2007) "Integrating Multiple Manufacturing Initiatives: Challenge for Automotive Suppliers," *Measuring Business Excellence Journal*, Vol. 11, No. 3, pp. 41-56.
- Johnson, D.M., Hokanson, D.R., Zhang, Q., Czupinski, K.D., Tang, J. (2007). "Feasibility of Water Purification Technology in Rural Areas of Developing Countries," *Journal of Environmental Management*, accepted and forthcoming in print, available online 24April07.
- Hokanson, D. R., Q. Zhang, J. R. Cowden, A. M. Troschinetz, J. R. Mihelcic, and D. M. Johnson (Winter 2007) Challenges to Implementing Drinking Water Technologies in Developing World Countries," *The Environmental Engineer: Applied Research and Practice Journal*, American Academy for Environmental Engineers, Vol. 43, No. 1, 31-38.

REFEREED PROCEEDINGS

- Bohmann, L., Johnson, D., Mattila, K., Onder, N., and Sutherland, J. (September 2007) "Future Engineers: Leading the Charge in the Service Sector" refereed paper published in proceedings for ASEE North Midwest Conference, Houghton, MI.
- Zhang, Q., Johnson, D.M., and Mihelcic, J. (September 2007) "Interdisciplinary Research for Graduate Education in Sustainability" refereed paper published in proceedings for ASEE North Midwest Conference, Houghton, MI.
- Sorby, S.A., Bohmann, L.J., Johnson, D.M., Mattila, K.G., and Sutherland, J.W. (June 2007). "Defining a curriculum for service systems engineering using a Delphi technique," refereed paper published in proceedings of *American Society for Engineering Education* conference, Honolulu, HA, June 24-28, 2007.
- Johnson, D.M., Bohmann, L., Mattila, K., Sutherland, J., and Sorby, S. (May 2007). "Meeting the Needs of Industry: Service Systems Engineering Curriculum," refereed paper published in proceedings of 2007 *DSI Mini-Conference in Service Science*, sponsored by IBM and Bentley College at Carnegie Mellon, Pittsburgh, PA, May 24-26, 2007.
- Johnson, D.M. and Mattson, D. (May 2007). "Hospital OR Inventory Process Improvement Prior to ERP Module Implementation," refereed paper published in proceedings of *Production and Operations Management Society, 2007 POMS Conference* – Dallas, TX, May 4-7, 2007.

PRESENTATIONS AND PROFESSIONAL ACTIVITIES

- Sorby, S.A., Bohmann, L.J., Johnson, D.M., Mattila, K.G., and Sutherland, J.W. (June 2007). "Defining a curriculum for service systems engineering using a Delphi technique," refereed presentation for *ASEE* conference, Honolulu, HA.
- Johnson, D.M., Bohmann, L., Mattila, K., Sutherland, J., Onder, N. and Sorby, S. (May 2007). "Meeting the Needs of Industry: Service Systems Engineering Curriculum," 2007 DSI Mini-Conference in Service Science, sponsored by IBM and Bentley College at Carnegie Mellon, Pittsburgh, PA, May 24-26, 2007, refereed presentation.
- Johnson, D.M. and Mattson, D. (May 2007). "Hospital OR Inventory Process Improvement Prior to ERP Module Implementation," *Production and Operations Management Society, 2007 POM* – Dallas, TX, refereed presentation.
- Bohmann, L., Johnson, D.M., Mattila, K., Sutherland, J., Onder, N. and Sorby, S. (February 2007). "Service Systems Engineering Curriculum," 2007 IBM Frontiers in Service, sponsored by IBM, San Francisco, CA, October 4-7, 2007, refereed presentation accepted.

RESEARCH IN PROGRESS

Submitted to Journals and Under Active Review/Revision

- Bohmann, L., Johnson, D., Mattila, K., Onder, N., and Sutherland, J. (May 2007) "Update on Service Systems Engineering Curriculum – One Year Later" *38th Annual Meeting of Decision Sciences Institute*, Phoenix, AZ, November 17-20, 2007, abstract accepted, presentation under development.
- Froese, R., Waterstraut, J. R., Johnson, D.M., Shonnard, D.R., Whitmarsh, J.H., and Miller, C.A. (April 2007). "Economic and Financial Viability of Lignocellulosic Ethanol," submitted to *Journal of Environmental Management*, under review.
- Johnson, D.M., Froese, R., Waterstraut, J.R., Whitmarsh, J.H., Martin, A, and Miller, C. (April 2007). "Business Viability of Biomass Co-Firing and Gasification for Electricity Generation," to be submitted to the *International Journal of Environmental Technology and Management.*, under review.
- Johnson, D.M. and Graman, G.A. (April 2007). "Outsourcing of Non-Core Operations in Higher Education," *38th Annual Meeting of Decision Sciences Institute*, Phoenix, AZ, November 17-20, 2007, abstract accepted and presentation under development.
- Quinn, A., LeMay, G., Larsen, P., and Johnson, D.M. (January 2007). "Service Quality in Higher Education," manuscript submitted to *Total Quality Management and Business Excellence Journal*, under review.

Grants Submitted or Under Development

A grant was submitted in July 2007 to the DOE/USDA as a pre-proposal for funding of alternative energy evaluation. I am a Co-PI for this project.

Also, I have worked on the pre-proposal for the Engineering Research Center that was submitted in May 2007. I am a senior investigator on this project.

Curriculum Development

As a part of the Service Systems Engineering team, funded by a \$500,000 three-year NSF grant, I participated in curriculum development meetings, developed outreach publications, and collaborated with the external panel.

Industry Experiences

On January 25-26, we toured Wells Fargo, Summit Brewing Company, and Northwest Airlines. The Northwest Airlines tour was 7 hours long. This contributed to learning more about service industries from an operations management perspective. We toured the systems operations control, maintenance operations, ground control operations, baggage operation, check-in operation, TSA security operation, and tarmac operations.

Work in Progress

I continue to collaborate with individuals from Michigan State University in the furthering of performance measurement techniques linked to benchmarking activities. This is an ongoing longitudinal, five phased study. We have recently added an individual from Texas Christian University to the research team.

I am continuing to collaborate with engineering regarding biomass based alternative energy research with emphasis on business modeling and forecasting.

These are in addition to the work identified in the beginning of this report.