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Upcoming Conferences

Twentieth Annual Conference of POMS

May 1–4, 2009, Orlando, FL USA

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Cheryl Gaimon

POMS President

College of Management

Georgia Institute of Technology

Resource Capabilities and Changes in Technology, Markets, and Competition

It is a great time to be a researcher and teacher of operations management. On a daily basis, we find motivation for our research as well as topics for classroom discussions. Lately, General Motors Corporation has offered a great deal for us to think about. Justifying GM’s substantial commitment of development and manufacturing resources to SUVs, George M. C. Fisher, the lead outside director on GM’s board said, “Giving consumers what they want is not a bad business decision” (Darlin, 2006). This statement is very disturbing and raises the question: *to what extent should a firm allocate resources to meet current markets?*

In the 1970s, GM also focused on current customer needs until Honda and Toyota introduced fuel-efficient and highly reliable vehicles that embodied changes in technology and drove changes in market characteristics and competition. Now, in the 2000s, GM is again focused on meeting current consumer needs instead of on creating resource capabilities to position it for the future. Consider hybrid technology. Since 2000, Toyota has sold more than 1 million Prius hybrids globally. GM has sold less than 15,000 hybrids in 2008 in the US; GM plans to start selling its Volt plug-in hybrid in 2010 projecting demand in that year of 10,000 units.

GM’s pursuit of short-term profit as opposed to long-term viability is one of many explanations for its current predicament. In contrast, for decades Toyota and Honda have been developing capabilities to meet *future* consumer needs. And when future demand is uncertain or subject to rapid change, as is most often the case, these firms create resource capabilities that are flexible so that they can switch from one model to another seamlessly. Honda, for example, generally considered the most flexible auto manufacturer in North America, required only a five minute stop in its manufacturing processes to complete a changeover from Civic compacts to the CR-V crossover. But Honda’s flexibility is not simply based on investments in flexible manufacturing equipment. Honda’s products and processes are designed to be assembled in the same way even if the underlying parts differ. This creativity and discipline in product and process design decisions is key to Honda’s flexibility.

Toyota’s commitment to flexibility is similar. From the outset, it manufactured the Prius on the same assembly line as the Camry. In fact, in the first years, according to industry experts, it did so at a loss. The experience gained by Toyota through volume-based learning drove

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Seb is the Feature Editor for Contributed articles. Note that we have several contributed articles in this issue, so Seb played a major role in the creation of the current issue. Thanks Seb!

**Submit articles, news, announcements, and other
information of interest to to the editor:**

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POMS Chronicle are available at: **www.poms.org**

FROM THE EDITOR: TIRP OR TARP?



Glen Schmidt

David Eccles School of Business, U. of Utah

TIRP: 4 supply chain management principles that might have averted the need for TARP

In late September I got a letter from an elderly acquaintance (snail-mail style, as she detests computers and email). She had been single and frugal her entire life, putting every extra penny into her retirement fund, and was now watching in horror as the U.S. stock market fell a quarter from its all-time high nearly a year earlier. (Little did she know that it would yet fall by another 1/4.)

Since I was a business school professor, she assumed I would be able to give her some advice on whether she should sell her stocks. But more poignantly, she was also asking me, "How could all of you highly-educated business people have built such a fragile financial system, one that turns out to be susceptible to a financial catastrophe of this type?" She had watched in confused disbelief as Fannie Mae and Freddie Mac were placed into conservatorship on Sep 7, as Lehman Brothers filed for bankruptcy on Sep 15, and as AIG had to be rescued by an \$85 billion bailout by the Fed on Sep 16. Couldn't the best and brightest minds have at least foreseen, let alone prevented, this type of financial unraveling, she asked? What would be the ultimate impact on the economy, and on the lives of retirees such as herself, let alone on workers who might lose their jobs in a recession, or even a depression?

I was tempted to say I was an "operations person" and not an economist or a finance expert, and thus remove myself from the situation. But then I got to thinking, how do our research and teaching apply to the financial crisis?

I certainly cannot claim to understand the intricacies of our financial system to the extent that I can give my friend a properly eloquent answer as to how this could have happened, or how to resolve the situation. However, let me posit that the destruction of her retirement account (and many others) was brought down by a dysfunctional supply chain – the supply chain for home loans. This dysfunctional supply chain has threatened to send our economy into the second great depression – and take the world's economy with it. An aggressive governmental intervention known as TARP (the Temporary Asset Relief Program) has been initiated to stem the downward spiral in our economy, and TARP will hopefully allow us to avert the Great Depression II. However, it will come at great expense, leading to a projected national debt of \$2 trillion (Montgomery, 2009).

From my perch as an operations person, it seems natural for me to think about the crisis in terms of several principles that we talk about in supply chain management. I will label these as TIRP – TIRP stands for the four principles of 1) Transparency, 2) Incentive compatibility, 3) Robustness, and 4) the need for a "Pinch point" (Stallkamp 2005 uses this term to effectively denote the entity which "coordinates" the supply chain). In other words, had the principles of TIRP been firmly in place, possibly there would not be a need for TARP.

To explore how the principles of TIRP might apply to home loans, let's take a cursory look at this supply chain setup (see Ashcraft and Schuermann 2008). The home buyer (borrower) interacts with a mortgage broker, who is the intermediary between the borrower

and the lender (e.g., Countrywide, also called the loan "originator"). The originator in turn pools mortgages from multiple home buyers and sells the bundle to an "arranger" (e.g., Lehman Brothers). From this bundle of loans the arranger creates a mortgage backed security or MBS (an instrument similar to a bond) – in creating the MBS, the arranger interacts with various agencies. It files documents with the SEC, consults with credit rating agencies, works with a warehouse lender who effectively inventories the loans until the MBS is sold to an investor, and interacts with an asset manager who is the agent for the ultimate investor (e.g., a bank in Iceland). Finally, there is a firm who services the loan (e.g., JP Morgan Chase), meaning it collects payments from the borrower and remits payments to the investor.

Now consider some of the possible ways in which the principles of TIRP might have applied (or unfortunately, how they didn't apply).

Transparency. There are many opportunities for information asymmetry (a lack of transparency) to exist in this supply chain. Starting with the relationship between the borrower and the mortgage broker, loans were created which did not require the borrower to document income, and the mortgage broker may not have always fully detailed the full terms of the loan (did you read in detail all the documents you signed when you took out a home loan?). At many places up and down the supply chain there are opportunities for the issue of adverse selection to arise. Further, there was no requirement for firms to report their risk exposure, which made it impossible for one firm to assess another firm's risk, which ultimately contributed to an eventual freezing of credit (NPR, 2008b). Thus in multiple respects, a lack of transparency seems to have been a contributing factor to the crisis.

Incentive compatibility. I believe incentive incompatibility played a huge role in creating the crisis. By incentive incompatibility, I mean that the incentives of individual players in the supply chain were not compatible with supply chain optimization. When every player in the supply chain maximized her own profit (and isn't maximizing your profit something we teach our students to do?), in the longer term the supply chain suffered. The home buyer was out to enhance his standard of living and gain from appreciation in property values. The mortgage broker wanted to transact as many loans as possible, without regard for whether the borrower would eventually default. The credit agencies were paid by those who used the credit ratings, and thus in the pursuit of profit seemingly abdicated their responsibility (Morgenson, 2008). Managers within the firms that needed bailouts (e.g., Fannie Mae, Freddie Mac, Citibank, AIG, and on and on) went home with almost unimaginable sums – it is not hard to argue that it was in their best interests to act as they did. They could participate in the upside, and claim little responsibility in the unlikely event of a major crisis materializing on their watch (see for example Thomas and Hirsh, 2008). "After all, it would end badly for everyone else too" (Nocera 2009).

Robustness. We teach our students about possible supply disruptions and how to mitigate the risks of disruptions. That is, we emphasize the need for supply chains that are robust to otherwise-catastrophic events such as earthquakes or even a supplier bankruptcy. In contrast, the supply chain just described was not robust to a downturn in property values – evidently some risk models did not even account for the possibility of such a downturn (NPR, 2008b). Further, the system was not robust to a failure of one firm

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FROM THE EDITOR/ PRESIDENT'S MESSAGE (CONT.)

(Continued from page 3)

in the supply chain – there likely would have been a widespread domino effect had a firm such as AIG (and others) not been rescued by TARP.

Pinch point. Why was there a lack of transparency, a lack of incentive compatibility, and a lack of robustness? Presumably because there was no entity (or pinch point) acting to coordinate the chain. It is a well-known principle of supply chain management that unless there is some coordination mechanism, optimal supply chain performance may not be achieved when each entity within the chain acts in its own self interests. To his credit, Alan Greenspan seems to be one of the few players in the supply chain that has publicly acknowledged any culpability in the crisis. He (and others) apparently assumed the supply chain would regulate itself, but in retrospect Greenspan seems to suggest that governmental regulation should have played a more significant role (Andrews, 2008). Whether the “pinch point” should be the government or some other party, the point is simply that a “pinch point” was lacking, to create transparency, incentive compatibility, and robustness.

I sent a reply to my elderly acquaintance on Saturday, Oct 4, 2008. The very next week, when she presumably received my snail-mail, the market dropped 18%. I have avoided calling her as I am not sure I want to hear how she fared with her investments. While it may be too late to save her retirement monies, new ways of applying what I have called TIRP are needed,¹ to help preclude any future need for another TARP.

References:

- Andrews, Edmund L. “Greenspan Concedes Error on Regulation.” *New York Times*, October 24, 2008.
- Ashcraft, Adam B. and Til Schuermann, “Understanding the Securitization of Subprime Mortgage Credit,” Federal Reserve Bank of New York Staff Report No. 318, March 2008.
- Montgomery, Lori. “U.S. Debt Expected To Soar This Year : \$2 Trillion Increase May Test Federal Ability to Borrow,” *Washington Post*, Saturday, January 3, 2009.
- Morgenson, Gretchen. “Debt Watchdogs: Tamed or Caught Napping?” *New York Times*, Dec 7, 2008.
- Nocera, Joe. “Risk Management,” *New York Times*, January 4, 2009.
- NPR, 2008a. This American Life episode 355: “The Giant Pool of Money,” May 9, 2008. http://www.thislife.org/Radio_Episode.aspx?episode=355.
- NPR, 2008b. This American Life episode 365: “Another Frightening Show About the Economy,” Oct 3, 2008. http://www.thislife.org/Radio_Episode.aspx?sched=1263.
- Stallkamp, Thomas T. 2005. *SCORE!: A Better Way to Do Business: Moving from Conflict to Collaboration*. Wharton School Publishing.
- Thomas, Evan and Michael Hirsh. “Rubin’s Detail Deficit,” *Newsweek*, Dec 8, 2008.

¹ I am certainly not the first to suggest something like this, and proposals exist from those who have studied the situation. For example, to help resolve an element of what I have referred to as incentive incompatibility, Ashcraft and Schuermann p. 66. recommend that “Either the originator or the arranger needs to retain unhedged equity tranche exposure to every securitization deal.”

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down the Prius’ production costs, ultimately making it profitable. It is clear that Toyota invested in resources capabilities as part of a long-term strategy as opposed to focusing on short-term profit. By the time GM enters the plug-in hybrid market in 2010, one has to wonder whether it will be able to compete with the sheer experience accumulated by Toyota.

Of course, the automotive industry is one of many that operate in highly uncertain markets subject to rapidly changing technology. Texas Instruments pursues an interesting strategy in developing resource capabilities to meet future customer needs. TI does not wait for its customers to recognize that they need TI’s chips for their new electronic products. TI pursued Nokia to use its digital signal processor as a core component before Nokia became the leader in the cell phone market. TI pursued Samsung Electronics to use its digital light processor as a core component before Samsung became one of the leaders in the big-screen high-definition television market. Moreover, TI stays at the leading edge of new product development in the electronics industry by designing and manufacturing chips for unusual or small companies, even if it means selling one chip at a time. Mr. Delagi, a Vice President at TI, is quoted as saying “We aren’t smart enough to know which of these small guys is going to be big” (Maynard et al., 2008).

Intel also plans for the long-term. Some time ago, Intel realized that, in the not so distant future, the capability of its microprocessor chips would exceed that needed to run the vast majority of existing software applications for Microsoft Windows. In response, Intel set out to *create* future demand for its products by funding other companies, many of them start-ups, to create software such as those used in multimedia applications. Therefore, *TI and Intel actively create the future demand their resource capabilities will meet.*

In my view, the only time it makes sense to commit substantial resources to meet current markets is in environments where technology, consumer needs, and competition are standing still. In today’s global economy, most firms must build future resource capabilities subject to dynamic markets and technology as well as considerable uncertainty. Furthermore, beyond responding to anticipated future consumer needs, *firms should invest in efforts to proactively create future demand for their resource capabilities.* The effects of change and uncertainty have strong impact on how firms should develop, design and manufacture products and processes, all of which are central topics in operations management.

Darlin, Damon, “Cashing in Its Chips,” *New York Times*, July 9, 2006.

Maynard, Micheline, Nick Bunkley and Bill Vlasic, “With Eye on Profits, GM Began Missing on Innovation,” *New York Times*, December 6, 2008.

Cheryl Gaimon, POMS President

BRIDGING THE GAP BETWEEN DOCTORAL TRAINING AND ROOKIE HIRING

A CONVERSATION WITH GÉRARD CACHON AND CHERYL GAIMON

BY RACHNA SHAH



Rachna Shah

Asst. Prof. of Operations & Management Science
Carlson School of Mgt, U. of Minnesota

Brief Bio: Professor Shah's research interests focus on the implementation of lean methods in manufacturing and service operations. In 2007, she received the "Wickham Skinner Early Career Research Accomplishments Award" from the Production and Operations Management Society. In 2004, she received the prestigious "Shingo Award for Excellence in Research" for her paper "Lean manufacturing: Context, Practice bundles and Performance" published in *Journal of Operations Management*. Professor Shah received her Ph.D. in Operations Management from The Fisher College of Business, The Ohio State University. She also has an MBA/MHA from The Ohio State University and a BA with Honors in economics and mathematics/statistics from Delhi University in India.



Cheryl Gaimon

Richard and Carol Kalikow Professorship & Regents Prof
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Brief Bio: Professor Gaimon's research focuses on strategic decisions regarding the evolution of a firm's resource capabilities for manufacturing and service domains. Specific interests include knowledge management, process improvement, implementation of new technology and new product development. She currently serves as the President for POMS, was the founding President of the POMS College on Product Innovation and Technology Management, and is a Fellow of the College. Special distinctions include "The 1999 Georgia Tech Research Award" for doctoral student development and two "Best Paper Awards" from the Decision Sciences Institute. Her research has been published in journals including *POM*, *Management Science*, *Operations Research* and *Decision Sciences*. She is the Management of Technology Dept. Editor for *POM*, and was formerly Associate Editor for *Management Science*, Sr. Editor of *Manufacturing & Service Operations Management*, Dept. Editor of *IIE Transactions*, Dept. Editor of *IEEE Transactions on Engineering Management*, and Assoc. Editor for *Decision Sciences*.



Gérard P. Cachon

Fred R. Sullivan Prof. of Operations & Information Mgt.
The Wharton School, U. of Pennsylvania

Brief Bio: Professor Cachon studies operations management with an emphasis on supply chain management, assortment planning, and retail operations. He explores how new technologies transform competitive dynamics and enable novel operational strategies for the delivery of goods and services. He is the current Editor of *Manufacturing & Service Operations Management*, the forthcoming Editor of *Management Science*, a former President of the *Manufacturing and Service Operations Management Society* of INFORMS and author of *Matching Supply with Demand: An Introduction to Operations Management (2ed)*. His articles have appeared in *Harvard Business Review*, *Management Science*, *Manufacturing & Service Operations Management*, *Operations Research*, and the *Quarterly Journal of Economics* among others.

Rachna: I have often wondered how doctoral training differs among business schools as well as which factors impact hiring decisions at these same schools. To bridge this gap, I recently spoke with operations management scholars from a diverse group of schools; the first of these conversations is reported below. I hope the discussions are helpful and insightful to both doctoral students and faculty.

Rachna: Can you please give a brief overview of the doctoral training?

Gerard: Our doctoral training is both broad and deep. Our students take about 20 classes. Course work includes both literature and methods classes. In addition to OM course work, students are required to take the intro to marketing, finance and public policy. Other required courses are somewhat dependent on the type of research question a student is interested in. Method training includes operations courses such as deterministic and stochastic optimization, markov chain analysis, and game theory, and statistics courses such as probability and econometric sequence. Our objective is to impart well-rounded training with depth in one special area.

In addition to conceptual and empirical training, we expect our students to be engaged in research from their first day of enrollment. They have to make a decision on their first day in the program about the specific research area (operations management, decision theory or information system) that they are going to pursue. They then begin to work with an advisor on a research project in that area.

Evaluation includes a comprehensive exam consisting of a written part taken at the beginning of the summer of the first year and an oral part at the end of the summer. The idea is to present the first year summer research paper during the oral exam.

A distinguishing characteristic of our program is the research seminars, which are focused on identifying interesting research questions and refining student's research taste. Presentation skills are very important to us; to improve presentation skills, our students TA in their third and fourth year of the program.

Cheryl: Our doctoral training is unique in that we provide a very broad base of training in both research methods and operations management topics. In addition to a series of optimization courses, our students take courses on empirical methods spanning econometrics, event studies, and survey based research. Students also complete in-depth Ph.D. seminars in at least eight different topics in operations management before taking their comprehensive exams.

Let me run you through our Ph.D. program quickly: we admit one to three students each year based on the quality of applicants and

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BRIDGING THE GAP BETWEEN DOCTORAL TRAINING AND ROOKIE HIRING (CONTINUED)

(Continued from page 5)

the college budget. We provide funding for five years. Students take doctoral seminars covering four OM topics in each of their first and second. Topics include operations strategy, new product development, supply chain management, revenue management, sustainability, service operations and global operations. In their first year students take both optimization and empirical methods courses. In their second year students continue to develop methods expertise by selecting courses that fit their specific interests.

During the first year, students are not assigned to specific faculty. Instead, during their first year, students speak with each faculty, read their papers, and develop an understanding of faculty research interests. Sometime during the spring semester of the first year, students interact more with a particular faculty they select and begin to explore research ideas of mutual interest. The intent is for this interaction to become the focus of the summer research paper. The research paper is presented to the whole faculty in October of the second year.

Students take a comprehensive exam at the end of their second year. The exam consists of eight questions reflecting topics in the Ph.D. seminars. Generally, the exam is in class and closed book-closed notes. During the second summer, students work on another research paper. In contrast to the first summer where a faculty provides considerable direction, the second paper is driven more by the student's initiative.

Our students don't teach in the first two years of the doctoral program. They may, however, have TA responsibilities such as grading. From year three onwards, students work on their dissertation specific research. In years three and four, students teach one course a year; the same course in both years. In the fifth year, students teach two sections of the same course. So, the way I see it, in the first two years of our program students focus on coursework to establish a broad understanding of operations topics and methods, and students begin conducting research. In years three through five students focus on their Ph.D. dissertation research.

Generally, the second year paper is submitted to an "A" journal and by the time our students are on the market, they have two or more papers under review and may even have a paper accepted for publication. Students are encouraged (and typically receive funding) to present their research at conferences. Therefore, by the time they are on the job market, our students know quite a number of faculty at other universities.

Rachna: Can you briefly describe the hiring process? Do you hire to fill a specific need or hire the best candidate?

Gerard: Although the goal is to balance the two (a specific need and hire the best candidate), our faculty are biased towards hiring the best candidate. We typically do not interview at national conferences. There is an online application, a committee of four faculty presents about 20 names to the full OPIM faculty, the full faculty vote and converge on 5-10 candidates, we then invite them for campus interviews. In selecting candidates, pedigree, two or three submitted/published papers, presentation skills, interesting research question, and research taste matter a lot.

Cheryl: Our objective is to select the best candidate. A specific need may serve as a 'tie breaker' if more than one candidate rises to the

top of our list. We advertise our position in the standard places, including a POMS announcement via email. Each applicant is 'scored' by each faculty individually. The scores are tallied and then all faculty get together to decide who we will meet at the fall conferences. Our faculty, usually two or more, interview the top candidates at national conferences and record qualitative and quantitative scores which are used to provide feedback to the whole group. The faculty meets again after the conferences and vote on which candidates to invite for campus visits. Everyone gets one vote. Usually, the top six or so candidates are invited for campus visits. Generally, the selected candidates have broad methods training and have one or more papers under review at "A" journals. We have been fortunate: even in a year when the dean has given us one slot to fill, if two strong candidates emerge, we have always been able to make two offers.

Rachna: What is a deal killer i.e. the student is invited for a campus visit, what would eliminate a candidate from being offered a job?

Gerard: The selected candidate has to be able to teach well. We don't have any programs where we can park a poor teacher. Besides, good teaching skills indicate good organizational thinking, ability to communicate difficult ideas in a simpler manner and an ability to illustrate the importance of the field. So, dull presentation skills and an inability to teach are definite deal killers. Finally, the selected candidate has to be able to transcend one's advisor and his/her research stream - he/she has to be able to demonstrate an individual research stream.

Cheryl: We expect that by the time a candidate reaches the campus interviews, s/he will have done background research on our faculty and are well prepared to describe how their interests may complement or blend with ours. The selected candidate must demonstrate research ability, teaching ability, and diligence. Presentation skills are a very critical indicator; the candidate should be well-organized and be able to answer questions articulately. Our faculty gets along very well with each other; this is a characteristic we cherish. So for us, a deal killer is a lack of "collegiality" on the part of candidate.

Rachna: What kind of schools do you aspire to hire from?

Cheryl: In the past, we have hired from MIT, INSEAD, Carnegie Mellon, University of Michigan, Ohio State University, University of North Carolina, Duke University, University of Rochester, University of Texas-Austin, and University of Western Ontario. I am delighted with the quality of the group we have assembled here.

Rachna: How important is the school or advisor in your hiring decision?

Cheryl: For us, it is not the school, not the pedigree that matters. It is the content of the training, demonstrated research and teaching abilities that are critical. Pedigree by itself is not a proxy for quality and in my mind selecting on the basis of pedigree leads to "inbreeding" that hurts the overall development of the field.

Rachna: What would be your advice to students with an aspiration towards Georgia Tech?

Cheryl: Submit your research to journals early in the doctoral program, so you have at least one and preferably two papers under review when you go on the market. The research should be rigorous

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NOMINATIONS FOR NEW POMS OFFICERS

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and must have the potential to make a strong impact on the field. Attend conferences and present research. Develop good teaching and presentation skills. Finally, pay attention to what it takes to be a good colleague.

Rachna: *What would be your advice to students from non-pedigreed schools with an aspiration towards Wharton?*

Gerard: For us the distinction between "pedigree" and "non-pedigree" schools is more like the distinction between schools that we have hired from in the past and those that we haven't. We have familiarity with schools that we have hired from already and less so from the other schools. That said, we do look at all applications and when we see an intriguing candidate from the 2nd set of schools we look at them carefully. I suppose the difference is that we have to spend more time investigating those candidates to make sure that their research training is strong, their research paper is solid, etc. But I wouldn't say that means their hurdle is necessarily higher than other candidates; I think the following characteristics improve their chances: 3 or 4 papers that are either submitted or published demonstrating strong methodological skills, sophisticated and interesting research questions and great models. Making us (i.e. Wharton faculty) familiar with their research early in their doctoral program improves their chances as well.

Rachna: *Do you see a gap between the skills/capabilities that you are imparting to your doctoral students and what you are looking for when hiring a rookie?*

Gerard: None.

Cheryl: Our frustration when hiring a rookie stems from their doctoral training – many students have narrow training in research methods limited to either optimization or empirical methods. How can we develop good scholars if they can only read half the OM literature intelligently? We also find some rookies have narrow training in operations topics. However, while we prefer a broad foundation in methods and topics, we recognize that a candidate's other talents may compensate.

Rachna: *Finally, what would be your advice to other doctoral program coordinators?*

Gerard: I wish other programs would put more emphasis on presentation skills of their doctoral students. I also wish that other doctoral programs would help refine their students' research taste. Research taste for me has three components: 1) a sense of what is an interesting problem; 2) a sense of research magnitude; and 3) intellectual quickness. "Interesting" includes being able to articulate your view of the world, compare/contrast it to the existing, conventional view of the world and an ability to change the received wisdom. Interesting means a non-intuitive answer, that is surprising, may be even shocking. An interesting answer changes the status quo and is counter-intuitive. Research magnitude encompasses the effect size – it is a non-marginal effect. Finally, intellectual quickness is an ability to field questions in a witty, insightful manner. It is an ability to seamlessly weave in and out of many different topics and/or functional areas.

(Continued at bottom of next column)



Submitted by: **Jatinder (Jeet) N. D. Gupta**

Past POMS President

Chair of POMS Nominating Committee

The University of Alabama in Huntsville

The 2009 POMS Nominating Committee has nominated the following individuals for the positions of officers and Board members. Their terms begin at the POMS Board meeting to be held in Orlando, Florida, USA (May 1- May 4, 2009), and will end at the POMS Board meeting in the year indicated in parenthesis.

President-Elect:

Marshall Fisher

University of Pennsylvania, USA



VP for Publications:

Amiya Chakravarty (Northeastern U., USA)

VP for Education (One position - 2012):

Dana Johnson (Michigan Technological University, USA)

Manoj Malhotra (University of South Carolina, USA)

VP Euro-Africa (One position - 2011):

Jose Machuca (Universidad de Sevilla, Spain)

Panagiotis Kyriazopoulos (Graduate Technological Education Institute of Piraeus, Greece).

Board Members (Two positions - 2011):

Cheryl Druehl (George Mason University, USA)

Mike Pinedo (New York University, USA)

Rachna Shah (University of Minnesota, USA)

Peter Ward (Ohio State University, USA)

The Nominating Committee followed a rigorous process, inviting nominations, including self nominations, and contacted potential candidates from all over the world. The Committee selected people who are committed to advancing the well being of our society and who are interested in participating in the organizational and administrative activities of our society.

The 2009 Nominating Committee consisted of Jeet Gupta – Chair and Past President (University of Alabama in Huntsville, USA), Wally Hopp President-Elect, (University of Michigan, USA), Joseph Blackburn, (Vanderbilt University, USA), Tomislav Mandakovic, (Florida International University, USA), Michiya Mortia, (Gakushuin University, Japan) Susana C. F. Pereira, (FVG, Sao Palo, Brazil) and Luk Van Wassenhove, (INSEAD, France).

(from previous column)

Cheryl: *My suggestion would be to provide broad research methods training to doctoral students; broad exposure to OM topics; and early introduction to conducting rigorous research. I find that there is talent coming out of a broad range of schools which is not limited by the type of school or the faculty advisor.*

Rachna: I thank you for your time and for forthright answers. I am sure our readers will benefit from your insights.

REPORTS FROM POMS COLLEGES & CHAPTERS



The College of Human Behavior in OM

Peter Ward

Fisher College of Business, Ohio State University

The formation of the College signals an important milestone in operations and supply research. It means that the POMS board and officers recognize and support the growing interest in various important aspects behavioral research in understanding how operations and supply chains work.

In one sense the formation of the College seems very natural and even belated. After all, as professors explaining OM to students, we often claim that operations managers need to learn to manage both the technical and people aspects of systems. Does it not just make sense that we acknowledge research into the "people" part of operations management in our major academic society? On the other hand, behavioral research has largely been the province of other management disciplines and those of us researching behavioral aspects of operations were often considered to be spanning boundaries, for better or worse. The formation of the College promises to provide a comfortable home for those of us who have an interest in how human behavior affects the workings of operations or supply chains.

This new home accommodates members who approach behavior in a variety of ways including economics, psychology, human resources, systems dynamics and various mathematical modeling approaches. The College provides an opportunity for researchers with diverse approaches to join together and to learn from each other, thus sparking interesting conversations and, I hope, collaborations. Members of the College will meet during organized tracks at regular POMS annual meetings and at special conferences every other year. The track for the Orlando conference is being organized by Elliot Bendoly of Emory U and Henrique Correa of Rollins College.

Upcoming Meeting: at the Orlando POMS Conference

Saturday, May 2nd, 2009 - from 5.20 PM to 6.00 PM: Business Meeting College of Human Behavior in Operations Management

This Business Meeting is open to everybody with an interest in the College and will provide an opportunity to receive updates on the College as well as a platform to voice comments, suggestions and other thoughts on future developments. See you in Orlando!



College of Sustainable Operations

Submitted by Fuminori Toyasaki

York University

The POMS College of Sustainable Operations is off to a great start. Looking toward the coming year, the College's inaugural workshop will take place this April in Orlando.

Upcoming Workshop:

The College is in the process of organizing a 1-day workshop in Orlando on April 30th 2009, the day prior to the *POMS Annual Meeting*. The workshop will include a number of informative talks about novel research areas within the field of sustainable operations, a keynote speech over lunch, and an Editors' Panel of leading journals publishing research related to sustainability and sustainable operations. More details will be announced later as the schedule is finalized.

For more information about the college, the workshop and related updates, please visit the College's website:

<http://ww.poms.org/colleges/csustops/>

Africa Chapter News

Submitted by Norman Faull

University of Cape Town, South Africa

Norman Faull, POMS VP for Europe and Africa has founded a not-for-profit, Lean Institute Africa, to promote the lean body of knowledge throughout Africa. In October in Cape Town the 'Lean Summit Africa 2008' drew nearly 350 delegates to a range of workshops and presentations. Topics from the banking, healthcare, insurance, the criminal justice system, mining and manufacturing were covered. A Toyota executive presented a paper showing the impact of continuous improvement on environmental metrics.

AWARD APPLICATIONS DUE SOON



Submitted by
Justin Ren
Boston University

The following four awards will be given during the POMS 2009 annual conference to be held in Orlando, Florida, USA, May 1- 4, 2009.

A. Emerging Economies Young Researchers Award: Due Jan 15, 2009:

A grant will be awarded to a Ph.D. student to fund travel to attend the POMS 2009 Conference in Orlando, Florida, U.S.A. The recipient will also be provided complimentary registration and shared room accommodation at the conference hotel. An additional \$200 may be provided to meet incidental expenses in Orlando.

The award committee may give the award to one or more Ph.D. students from each of the three regions Africa, Australasia, and Latin America. The total expenses for each region should not exceed \$ 2,000.

Submission Procedure: Eligibility: The student must be currently enrolled (at the time of the application) in a Ph.D. program in an Operations Management related field in a country with an "emerging economy" from one of the three regions Africa, Australasia, and Latin America.

An institution (university or corporation) may sponsor a student with a commitment to partially fund the cost of travel from abroad to the U.S.

A Ph.D. student may also apply directly for this award. In either case the Ph.D. student should submit an extended abstract of at most 5 double-spaced pages of the paper to be presented at the POMS conference in Orlando. The applicant should provide a letter from an official of her/his academic institution stating that she/he is in good standing in her/his Ph.D. program in an Operations Management related field. Students should submit their abstracts by January 15, 2009 by emailing them in pdf format to, the Executive Director of POMS, Dr. Sushil Gupta, (poms@fiu.edu).

Criteria: To receive the award, a Ph.D. student must demonstrate evidence of substantial promise as a scholar in an Operations Management related field. In each region (Africa, Australasia, Latin America), where students exhibit such promise, the award will go to the student that demonstrates the largest promise as judged by the committee members.

Notification Procedure: The award committee will notify the winner(s) of the award by February 28, 2009. An award plaque along with a check will be presented to the winner(s) at the POMS Conference in Orlando (May 1-4, 2009).

Award Committee: The award committee and its chair consisting of POMS members will be appointed by POMS Board on the basis of the recommendations received from the POMS Regional Vice Presidents.

B. Martin K. Starr Excellence in Production and Operations Management Practice Award: Due Jan 31, 2009:

The Production and Operations Management Society (POMS) has instituted the *Martin K. Starr Excellence in Production and Operations Management Practice Award* to recognize contributions made to the field of Production and Operations Management (POM) by POM practitioners. We are now seeking nominations for the fourth award which will be presented during the twentieth annual POMS' conference to be held in Orlando, Florida, U.S.A., from May 1 to May 4, 2009.

General Guidelines The award is for an "individual" and not for the "organization".

The award is open to professionals at all levels working in the Operations Management area in service and manufacturing industries; as well as in not-for-profit and government organizations.

The award is based on exceptional quality of contribution to the POM field.

These contributions are not restricted to a single organization and may span time spent at several organizations during the career of the candidate. The cumulative contributions made by the candidate during his/her career will be the basis of the evaluation.

In addition to receiving an attractive plaque, the award recipient will be prominently featured in the *POMS Chronicle* and *POMS Web Page*. The award ceremony includes a full description of the contributions of the award winner who is encouraged to respond briefly.

The nominating committee for this year consists of the following:

- Corey A. Billington (IMD, Switzerland)
- Kasra Ferdows, Professor, Georgetown University, Washington, D.C., U.S.A.
- Sushil Gupta, Professor, Florida International University, Miami, Florida, U.S.A.
- Hau Lee, Professor, Stanford University, Stanford, California, U.S.A.
- Rafael Menda, Director, Operations Strategic Planning, McNeil Consumer & Specialty Pharmaceuticals, Ft. Washington, Pennsylvania, U.S.A.
- Dino Petrarolo, Managing Director, Shatterprufe, Johannesburg Area, South Africa (Chair).
- Martin Starr, Rollins College, Winter Park, Florida, U.S.A.

Please send your nominations to Dino Petrarolo at (dpetrarolo@shatterprufe.co.za) with a copy to Sushil Gupta (poms@fiu.edu) by January 31, 2009. The nomination should include a resume of the candidate and a narrative, not to exceed two pages, of the contributions to POM during the career of the candidate.

AWARD APPLICATIONS DUE SOON (CONT.)

C. Wickham Skinner Best Unpublished Paper Award: Abstracts Due Jan 15, 2009, Applications Due Feb 1, 2009:

Definition of Unpublished Paper: Papers presented at the POMS-2009 Orlando conference and those under review by POM are eligible for this award. Papers submitted for this award must not be under review by any other journal or conference. The author(s) certify this through the submission of their paper to this award competition. An individual can be an author or co-author on only one paper submitted for the award. Any multiple submissions will require contacting all the authors to determine which paper will be submitted. The resulting delay may prevent consideration of the papers for the award.

Procedure for Submissions: By Feb 1, 2009, please email a copy of the complete paper excluding the cover page with author information, using the proper editorial format (see "Information for Contributors" in *Production and Operations Management*), along with the cover page in a separate electronic file, to the committee chair, Michael Lapré via e-mail at michael.lapre@owen.vanderbilt.edu along with a copy to the Executive Director of POMS via e-mail at poms@fiu.edu. For submissions already under review with *Production and Operations Management*, indicate which department editor or special issue editor is handling the paper. For submissions not yet under review, indicate the appropriate department editor. The committee chair will acknowledge receipt of each paper and forward new submissions to the appropriate department editor of *Production and Operations Management*. Simultaneously, each paper will be reviewed by the award committee. Authors should also submit their paper (abstract only) for presentation at the POMS-Orlando conference (<http://www.poms.org>) using the regular paper submission process by January 15, 2009. **Please note that the abstract submission deadline for submission of papers to the conference is January 15, 2009.** Finalists must present the paper at the conference to be considered for award.

Basis for Unpublished Best Paper Award: Papers will be judged on overall quality with careful attention given to both relevance and rigor.

Award Presentation: The awards will be announced and presented to the winners at the closing ceremony of the POMS-2009 Orlando meeting on Monday, May 4, 2009 (multiple authors of an award-winning paper will share the award money, but each will receive an award plaque and be honored as an award winner). The awards include:

- Public Recognition of the award winner(s) at the POMS Meeting
- A plaque
- A check for \$1000 for the first place or \$500 for runner up if any. The winner will also undergo an expedited review by POM, the flagship journal of POMS.

Best Unpublished Paper Award Committee:

Michael A. Lapré, Vanderbilt University (Chair)
 Nicole DeHoratius, University of Portland
 Stylianos Kavadias, Georgia Institute of Technology
 Serguei Netessine, University of Pennsylvania, visiting INSEAD
 Kingshuk K. Sinha, University of Minnesota
 Andreas C. Soteriou, University of Cyprus

D. Wickham Skinner Early-Career Research Accomplishments Award: Applications Due Feb 1, 2009: *Definition of Early-Career Researcher*

An "Early-Career Researcher" will be defined as someone who has received a doctoral degree (or its equivalent outside of the U.S.A.) within the previous six years. For the POMS-2009 Meeting, 2003 is the starting year for inclusion.

Procedure for Submissions: By February 1, 2009, please email copies of the materials listed below to committee chair, Panos Kouvelis via e-mail at kouvelis@wustl.edu along with a copy to the Executive Director of POMS via e-mail at poms@fiu.edu. The committee chair will acknowledge receipt and distribute copies to the judges. Additions to the portfolio cannot be made after the February 1 deadline. The portfolio should include:

- A cover letter of no more than two pages applying for the award that highlights the major contributions of the applicant's entire body of research
- A copy of the candidate's resume
- Copies of one to three key papers
- A maximum of three letters of recommendation for the award from other academics or area/department chairs describing the applicant's contribution to research, or from practitioners confirming the successful application of research findings.

Basis for the Early-Career Researcher Award: Accomplishments can be measured in many ways, with publications and presentations given primary importance. Work published (or formally accepted for publication) or presented at a conference within the six-year eligibility period will be considered in the evaluation process if properly documented.

The judges will evaluate the impact of the body of work in terms of its ability to broaden, extend, and alter the way that POM is conceptualized, practiced, and viewed. The judges are not required to give awards if applicants do not meet the standards they establish.

Award Presentation: The awards will be announced and presented to the winners at the closing ceremony of the POMS-2009 Orlando meeting on Monday, May 4, 2009. The awards include:

- Public Recognition of the award winner(s) at the POMS Meeting
- A plaque
- A check for \$1000 for the first place or \$500 for runner up if any.
- Complimentary POMS membership for the following two years.

Early-Career Research Award Committee

Panos Kouvelis, Olin Business School, Washington U. (Chair)
 Bert De Reyck, London Business School
 Maqbool Dada, Purdue University
 Karen Donohue, Carlson School of Management, U. of Minnesota
 Chung Yee Lee, Hong Kong U of Science and Technology
 Joseph Milner, University of Toronto
 Xuanming Su UC Berkeley

(Continued on page 11)

AWARD APPLICATIONS DUE SOON (CONT.)

E. Wickham Skinner Teaching Achievements Award: Applications Due Feb 1, 2009: *Definition of Teaching Achievements Award:*

The purpose of this award is to recognize impact and innovation in Production and Operations Management instruction.

Procedure for Submissions: By February 1, 2009, applicants should send a 3-5 page overview of their teaching achievements (positioned in the context of the teaching environment at the applicant's institution) and favored strategies to committee chair Andy Tsay at atsay@stanfordalumni.org with a copy to the Executive Director of POMS at poms@fiu.edu. Beyond this page limit, applicants may attach supporting exhibits, such as those listed below as desired forms of evidence.

POMS urges department chairs or peers to encourage worthy candidates to apply.

Award Criteria: In their evaluation of these materials, the judges will give primary attention to:

- Evidence of *pedagogical excellence*. This evidence may take forms such as student evaluations, letters of support from former students or assessments of knowledgeable colleagues.
- Evidence of *creativity and/or innovation*, which the applicant might express in approaches to teaching (e.g., team teaching, student teams, action learning, role playing, use of technology, etc.) and/or new ways for understanding actual operations problems and the methods that can be applied to deal with them (e.g., frameworks, software, etc.). This evidence could consist of descriptions of teaching techniques by the applicant, letters from students or other academics, or other materials.
- Evidence of *impact*. Various types of evidence could be offered to demonstrate that the applicant's teaching has influenced the world of POM. Having taught large numbers of students is certainly one measure of impact. But more important is evidence that the applicant's teaching has influenced behavior. This could be documented via letters from former students, statements from people in industry who have hired former students, letters from other academics who have themselves been influenced by the applicant's teaching (e.g., by adopting a book, case or course structure).

Award Presentation: The awards will be announced and presented to the winner(s) at the closing ceremony of the POMS-2009 Orlando meeting on Monday, May 4, 2009. The awards include:

- Public Recognition of the award winner(s) at the POMS Meeting, in the POMS Chronicle, and on the POMS website
- A plaque
- A check for \$1000 for the first place or \$500 for runner up if any.

Award Committee

Andy Tsay, Chair (Santa Clara University)
 Kyle Cattani (Indiana University)
 Sam Wood (Responsive Technologies)
 Nagesh Murthy (University of Oregon)
 Jose Machuca (Universidad de Sevilla)

F. Best Student Paper Competition: College of Supply Chain Management: Applications due Jan 12, 2009:

Each submitted paper will be judged based on its contribution towards the advancement of theory and practice of supply chain management. Four finalists will be invited to present their paper in a special session at the 2009 Annual POMS conference in Orlando on May 2, 2009. Presentation quality will also be taken into account to decide the first and second prizes. The first prize is accompanied by a \$500 honorarium and the second prize is accompanied by a \$250 honorarium. In addition, all finalists will be awarded up to \$500 of travel support and complementary conference registration for the 2009 Annual POMS conference. All prizes will be awarded during the conference.

There are four conditions for eligibility:

1. Entrant must have been a student on or after July 1, 2008. Only one paper can be submitted by an entrant.
2. The submitted paper must present original research conducted primarily by the entrant. Some assistance by other individuals (such as the student's faculty advisor) is permitted as long as the student is at least the "first author" on the paper in principle. This should be reflected in the advisor's letter.
3. The research must have been conducted while the entrant was a student.
4. The topic of the paper should fall within the scope of supply chain management, including: Inventory management; Supply chain coordination; Integrated supply chain planning; Sourcing relationships and strategy; Supply chain design and facility location; Organization of the supply chain function; Managing product variety in supply chains; Coordination of product and supply chain design; The role of information technology in supply chain coordination; Logistics, order fulfillment and distribution; Supply chain risk management; Channel management. For a more detailed description of the supply chain area within the *POM Journal*, please see <http://www.poms.org/journal/departments/>. A complete entry includes:
 1. A cover document in PDF with the entrant's name, current affiliation, address, e-mail address, telephone number, the name and email address of the entrant's advisor. The file name should be the entrant's full name.
 2. The paper in PDF, *with at most 32 pages* in standard format (1" margins, double-spaced, 2 point font.) *Author names should not appear* on the paper. Papers exceeding the page limit will be returned without review.
 3. A cover letter from the advisor in PDF that includes the student's name, the title of the student's paper and a statement that indicates the eligibility requirements have been met (in particular, that the research is primarily the student's with minor assistance from other individuals).

The three items above should be emailed to Saif Benjaafar (saif@umn.edu <<mailto:saif@umn.edu>>), Chair, POM SCM Student Prize Committee with a subject heading "POM SCM Student Paper". Deadline for Submission is January 12, 2009, 12pm (EST).

WHY I LOVE GROCERY SHOPPING



Dorothee Honhon

The University of Texas at Austin

McCombs School of Business

dorothee.honhon@mcombs.utexas.edu

I love shopping. I am not talking shoe shopping or Christmas shopping, I love grocery shopping. I love walking down the aisles of my favorite organic grocery store. I always come back home with 2 quarts of organic soy milk and a great new set of research ideas.

When I entered the store the other day, I was given a flyer inviting me to choose from their “top ten wines” list. There was no mention of rankings or awards, it was simply a list compiled by their “expert wine buyers”. Each wine was appropriately stocked up in a pyramid-like display in the wine section. It got me thinking about how one compiles such a list. Certainly profit margin and stock availability are prime concerns but what about taste and quality? Or is it enough to create an illusion of quality through this very serious looking pseudo-expert-based list? After all, a very small percentage of shoppers can call themselves wine experts... Each wine on the list was strategically paired with one of eight cheeses that were listed at the back of the flyer and each cheese was displayed next to the corresponding wine as well as in the cheese aisle. Surely I don't know enough about wine but I do know cheese. A quick look at the list and the predominance of American cheeses on it got me to conclude that the expert wine buyers must have been primarily concerned with their bottom line. Yet, lured by the promise of “oaky vanilla, dried cherry and peppery spice” flavors, I put a bottle of the recommended California Pinot Noir in my cart, all the while thinking that if, even after all this thinking I was to succumb, this promotion had to be great success.

Later, in the cheese section, seeing the same cheeses again got me to think further about the wine-cheese pairing on the flyer and what it meant in terms of customer choice. Essentially, the pairing was establishing the products as complementary in the minds of the customers. Typically retailers do not get to decide on the complementarity relationships amongst products: nacho chips naturally go with salsa, yogurt with granola and coffee with cream, etc. The retailers only get to exploit the connections between these product categories by strategically positioning them close to one another in the store. But in this case, the store could create a link between two products, with all of its implications on store operations and inventory costs. Stocking decisions for complementary products have to be made more carefully because of the impact of a stock-out not only on the primary category but also on the complementary good. If the flyer promises “an amazing combination” between my Pinot Noir and the 24 month-aged Vermont Cheddar cheese, I might think twice about buying the wine after facing the disappointment of an empty shelf in the cheese section. Also the fact that each cheese may be paired with more than one wine complicates the stocking decision since one has to take into account not only the demand for that cheese (independently of the wine), but also the demand for the wines and the substitution pattern between them when deciding on the stocking level.

A few steps further, in the coffee aisle, I desperately looked for the organic, shade grown, fair trade, decaffeinated, dark roast, Sumatra coffee

beans in bulk which I buy every week but concluded with great sadness that it was out of stock (or no longer carried?!). I was out of coffee beans at home and, knowing very well that this was the only place that sold that variety, I found myself faced with a terrible dilemma: what characteristic was I most willing to give up on? Price was not a concern because all coffee beans in bulk were sold at more or less the same price. Having recently given up on caffeine, I could certainly not compromise on that dimension. I basically had two choices: forgoing my ethical principles and opting for the regular, decaf, dark roast, Sumatra coffee or sacrificing on taste by choosing the organic, shade grown, fair trade, light roast, decaffeinated Java coffee beans. I certainly wished the store carried another variety of coffee that met all my ethical and taste requirements but would it make sense for them? After all I was going to substitute and that would translate into a sale for them. Worse, my purchase could be misinterpreted as a preference for what is really only a second choice.

Later, in the pet food aisle, I counted 22 different varieties of my cats' favorite premium cat food brand in one-meal can format. It got me thinking whether it really made sense to offer that wide of an assortment for this specific product category. Do cats, like humans, exhibit a taste for variety, which is the main reason why we do not consume the exact same products every day (I certainly love my husband's basil pesto pasta but I would not want to eat it at every meal)? But could this be too much variety? Does everyone spend the time to read all 22 cat food labels before deciding on “beef feast in gravy” and “chopped grill feast”? Has anyone ever given up after reading 18 can labels, left and fed their cat on leftover Chinese food for a week? I also noticed that the same brand was offering prepackaged boxes of 24 cans at a significant discount price compared to that of 24 individual cans. However, these boxes contained only three different varieties which were either all beef, all chicken or all fish-type flavors. Given that Fiona has a preference for red meat and Miss Marple for fish, what was I to do? Buy two big boxes of 24 cans (one beef, one fish) to take advantage of the discount while pleasing both of my little monsters? Buy one big box of chicken-flavored meals as a compromise even if it meant facing the risk of more meowing throughout the night? Or build my own basket from the assortment of individual cans? Then I thought about the manufacturer and the reverse decision he had made. Why did he decide not to offer a box with more than three different flavors? Was he trying to induce picky customers like me to choose individual cans, while seducing more price-sensitive customers with the discount on the big box? Also how did he decide on the flavors to include in the boxes? Are these the most popular ones, the most profitable ones or a combination of the two?

When I got home that day, still thinking about how to model all these questions, I realized that I had forgotten to buy the very ingredient I went to the store for: French butter made from cows lazily grazing on the salty grass on the Brittany coast. My husband was not impressed!

ACCELERATING PRODUCT DEVELOPMENT PROCESSES WHILE INCREASING CUSTOMER SATISFACTION: A 7-STEP APPROACH TO ACHIEVE EXCELLENCE



By Jehanzeb Noor
MIT/McKinsey & Company
and



Dr. Daniel Whitney
MIT, Engrg. Systems Division

1. Introduction

The research is based on a two-year (2005-2007) project sponsored by MIT to improve automotive product development processes. The case study focused on managing the design and performance of conflicting customer attributes for vehicle door systems (closures), i.e. door closing effort, wind noise at high speeds, margin and flushness in appearance, water leaks, and vibration noises (chucking). At a major US carmaker, we followed, documented and analyzed the activities of Closure Systems Integrators (CSIs), the supervisory engineers for systems decisions and attribute balancing. Through our analyses and recommendations, we were able to significantly reduce warranty issues while effectively reducing lead time. Our methodology, analyses and findings are applicable to any complex system product development process (Noor, 2007).

2. Background

System attributes are tightly coupled and driven by multiple components (Calvano and John, 2003). For instance, the thickness and stiffness of the sealing around the door determines both the amount of closing effort and wind noise, but in opposing directions. The stiffer/thicker the seals are, the higher is the closing effort for the door. At the same time, thicker seals result in lower wind noise, while driving at high speeds, lower chucking and fewer water leaks. Several other components have conflicting effects on attributes. In order to document and analyze the design process that delivers these attributes and optimize the decisions, we used the design structure matrix model explained in detail below (Whitney, 2006).

3. Steps in accelerating a product development process

Through our study of engineering specifications and expert interviews, we identified seven analytical steps that are required to make recommendations for improvement.

I. Document the current process

The design structure matrix (DSM) captures the list, sequence and interactions of steps:

The same tasks are placed on each axis of the matrix. Interactions marked by "x's" indicate information flow is required between the tasks for completion and execution. X's found above the diagonal also indicate a backward information flow, which is a task downstream can change the outcome of an upstream task.

We used various information sources (details to follow) for documenting the 4-year process of designing individual components and performing system tasks to convert a clay design of the side door to an actual, manufactured system.

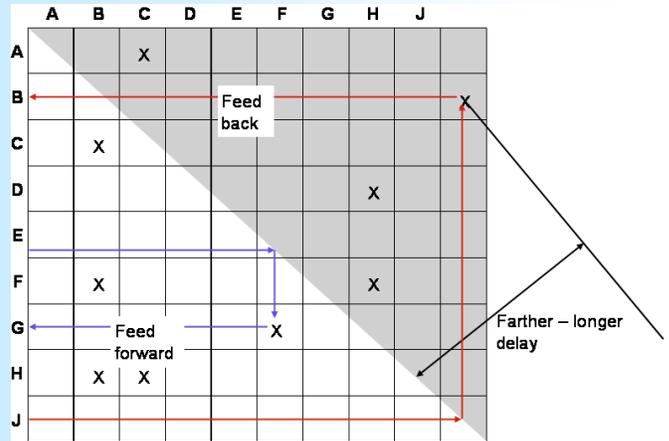


Figure 1: Sample DSM – with the list of tasks and interactions for information flow

II. Capture interdependencies

The DSM was a valuable tool to show how customer attributes overlap and conflict, while documenting the design steps for individual components. Figure 2 below shows how one design parameter, seal gaps defined as the distance between the closed door and car body, drives performance on three different attributes.

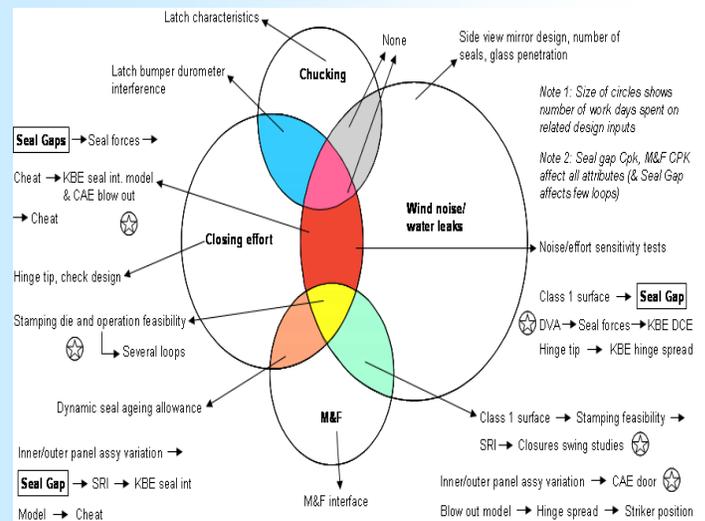


Figure 2: Attribute overlap and component design conflicts show key conflicts

The arrows show decision/information flow in the design process and the loops show rework loops for design iterations.

Documenting design interdependencies provided insights and an objective fact base for discussions, which did not exist before at the automotive company.

(Continued on page 14)

ACCELERATING PRODUCT DEVELOPMENT PROCESSES WHILE INCREASING CUSTOMER SATISFACTION: 7-STEP APPROACH TO ACHIEVE EXCELLENCE (CONT.)

(Continued from page 13)

III. Utilize simulations to understand current process length and constraints

The first two steps provided a comprehensive picture of design tasks, interactions and conflicts. Next, we studied five different car programs to understand how long each design task takes for completion, on average and within one standard deviation, and the task’s probability of completion at first pass. Data were collected through a comparison of project plans and their actual program completion dates, as well as interviews from engineers on the actual projects. With this data (durations in work-months) in hand, we used DSM simulations.

The simulation results (figure 3) show a distribution of total time required of 170 work-months on average, whereas the target duration for a US automaker’s car program is 50 work-months. The findings were confirmed as engineers explained “skipping/guessing tasks” to meet project deadlines.

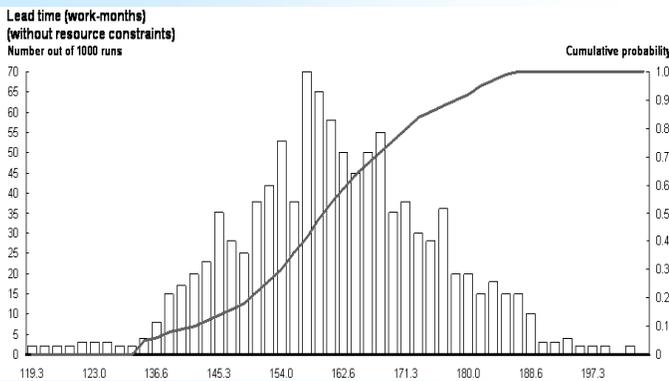


Figure 3: Project/task duration simulation results show significant overage on target

Several other bottleneck tasks were also identified through simulations. For example, sheet metal surface design, seal gap and component design and component packaging take 5-10 times longer to complete than prescribed timing. Methods to reduce development duration would include more use of standard designs, knowledge from past models, and computer aided engineering (CAE). Thus, we tested various possibilities to accelerate project timing (from lessons learned in literature review, comparing the US automaker process with Toyota’s, and understanding the causes of rework and bottlenecks, e.g., lack of modeling tools or no system integration (Cusamano and Nobeoka, 1998).

IV. Test various scenarios to meet targets

The simulations shown in Table 1 were set-up to test process improvement ideas.

Process	Process key
1	Current PD (with actual resource in the as-is state)
2	Current PD (with infinite resource in the as-is state)
3	PD and prioritized standardization (tearing, actual resources)
4	PD and prioritized standardization (tearing, infinite resources)
5	PD with complete standardization (tearing + other bottlenecks)
6	Standardized PD (from 5) with knowledge management
7	Standardized PD with knowledge management (6) + tradeoff tools

Table 1: Various process designs to reduce project durations

Tearing is an algorithm of identifying loops in the design structure matrix, when a process step undergoes iterations. Tearing identifies the steps that should be standardized to contain rework. Companies learn which tasks/steps to “tear” with many years of experience. Because the US automaker had not used design standardization as a lever of efficiency (Morgan, 2002), we used the algorithm. Through empirical comparisons between on-time and late car programs, we found knowledge management and use of system balancing tools (CAD, CAE, Knowledge-based Engineering – KBE) to help. Additionally (as shown in figure 4), lack of resources (engineers) did not prove to be the constraining factor.

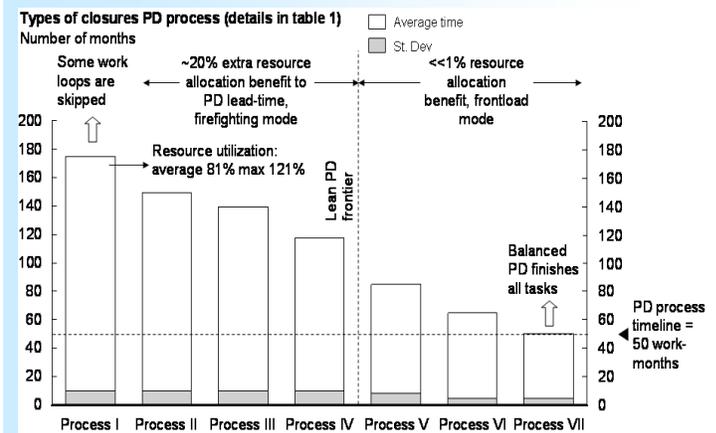


Figure 4: Acceleration of the PD process with knowledge and standardization levers

The next step in our method redistributes tasks and resources, per our learning.

V. Define system integration approach and task distributions

We bucketed all design task duration and resource utilization in the DSM by five major types. Following is the comparison of resources spent on the current and improved (#7 in table 1) product development processes (figure 5):

ACCELERATING PRODUCT DEVELOPMENT PROCESSES WHILE INCREASING CUSTOMER SATISFACTION: 7-STEP APPROACH TO ACHIEVE EXCELLENCE (CONT.)

(Continued from page 14)

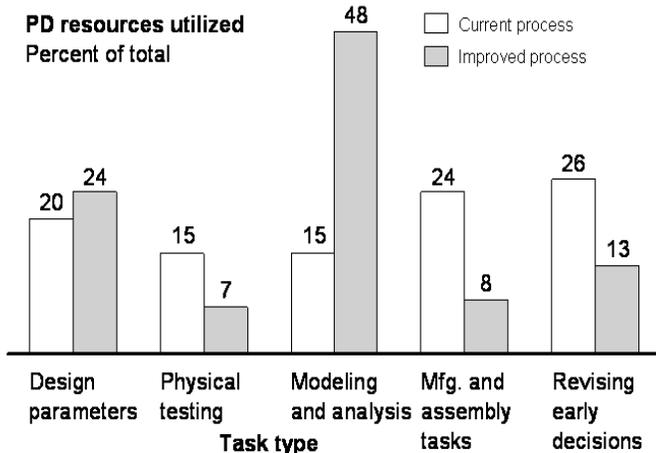


Figure 5: Shift of tasks from rework/testing to upfront modeling (improved process)

Currently, over 50% of the work is driven by assembly and manufacturability-related rework, especially downstream in the PD process. We discovered three reasons for this:

- i) lack of early involvement of manufacturing and assembly teams in the design process
- ii) reliance on prototypes to test dimensional feasibility and attribute performance
- iii) weak system coordination earlier on, whereby decisions are made as late as possible

Adopting our research insights means that the OEM would invest in modeling tools and analytical work for system tradeoffs, including design for assembly instead of using 40% of its engineering time on design iterations and physical tests of components. Simultaneously, the lead-time (on average) would reduce from ~170 work-months to 50 work-months, the target duration. In order to have the task redistribution, the US automaker needed to invest in knowledge management, specifically in opportunities identified in constructing the process DSM's task list and interactions.

VI. Rollout knowledge management programs

There is a lack of knowledge documentation and referable materials on lessons learned and mistakes made in the design process of previous car programs. This leads to a significant amount of rework iterative loops in the PD process (Clark and Fujimoto, 1991) at the US automaker. Our insights came from the process of constructing the DSM, which showed how little knowledge is documented (table 2). Note that "marks" imply component interactions (information flows in the design process) that could cause rework or bottleneck delays; inputs imply process steps in the DSM while designing components/making system tradeoffs. It is critical for engineers to be aware of these interactions to avoid wastage of resources:

Information source	Number of inputs	Number of marks per inputs
Design documents	23	3.00
D&R/Component engineers	52	4.86
CSI-type engineers/supervisors	44	7.23
Cross functional engineers/experts	82	9.18

Table 2: Research on the DSM shows knowledge is retained in people, not databases

Due to its large organizational size and varying abilities of engineers, the US automaker faced difficulties in obtaining system information. The engineers had to rely on their experience or learn by doing. Furthermore, a study of the design documents (where they existed) showed that very little system tradeoff knowledge was addressed (figure 6), again leading to costly rework and dependence on people versus robust systems:

As engineers changed roles or as attrition of people occurred, the valuable system knowledge was lost, especially when CSIs moved around.

Our knowledge contribution by documenting the process, timing and interaction for closures gave this engineering cluster a jump start in centralizing system knowledge.

VII. Syndicate with stakeholders and monitor for continuous improvements

Before anything could be done about the various findings on the design process, it was paramount that agreement from all stakeholders needed to be obtained. To obtain this agreement, we used the fact base insights, and recommendations.

The stakeholders were:

- i). The Chief Engineer (key decision maker on use of resources and knowledge systems)
- ii). Manufacturing supervisors at plants (affected by amount of physical testing required)
- iii). Supplier engineers (especially sheet metal, which has the most issues downstream)
- iv). Closure Systems Integrators (CSIs, who are responsible for system/attribute balance)

(Continued on page 16)

ACCELERATING PRODUCT DEVELOPMENT PROCESSES WHILE INCREASING CUSTOMER SATISFACTION: 7-STEP APPROACH TO ACHIEVE EXCELLENCE (CONT.)

(Continued from page 15)

v). Design studio (particularly introducing assembly-unfriendly designs and late changes)

With the agreement of all stakeholders, we introduced recommended changes such as:

- a. Early involvement by manufacturing and supplier teams (by 18 months or more)
- b. Standardization of common components across programs, such as hinges/latches
- c. More decision-making power to CSIs and assignment of system engineers to programs
- d. Investments in centralizing knowledge from programs and detailing system guidelines
- e. Development/usage of KBE/CAE tools, e.g., seal gap optimizer for attribute balance

More specific details are proprietary to the OEM and hence cannot be discussed, but the improvements and acceleration in the PD process are significant.

Breakdown of knowledge captured
100% = 80 design documents for closures

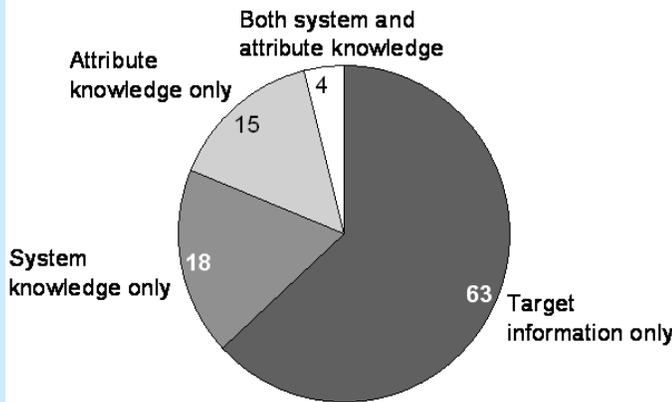


Figure 6: Scrutiny of all documents at best showed component/attribute targets only

4. Contribution to improving customer satisfaction

Changes to the final program timing and early results from customer feedback showed that warrant issues had declined by over 50% for wind noise, closing effort and water leaks for side doors. This applied to two, all-new car programs introduced in the market in 2007-08, and were well-received by the market. In addition, we showed up to 30% reduction in process lead-time for closures. The effect would have been greater, but our research timing meant that findings were applied during the second half of the programs.

5. Organizational Considerations

Effective system coordination required that all component inter-

faces affecting attributes were identified thoroughly and correctly (Suh, 2001). We used the Datum Flow Chain method (figure 7) to achieve this end, and showed that dimensional key characteristics affecting the system followed through several engineering clusters:

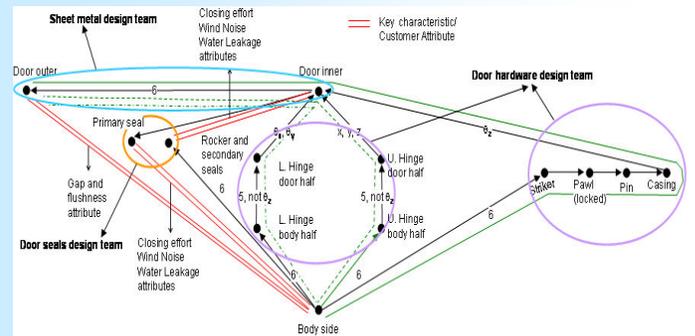


Figure 7: Datum Flow Chain's (Whitney 2004) dimensional/organizational interface

The CSIs and their direct reporting system engineers were given the responsibility to coordinate the interfaces. Similarly (though not shown here), stamping (sheet metal) engineers, manufacturing supervisors and designers were required to sign off on drawings. The Datum Flow Chain proved to be a valuable tool to ensure interface management.

6. Transferability of learning to other products and sectors

Comparing our findings with best-in-class product development processes, such as Toyota revealed considerable overlap, which confirmed wider applications of our findings (Morgan, 2002).

Although our case studies came from the auto industry, the learning on complex system PD processes is applicable to all engineering products, e.g., a plane's fuselage, a photocopy machine or a personal computer (Ottino, 2004; Eppinger and Ulrich, 2000). Moreover, the automaker itself used the success of the pilot in closures to transfer the approach to chassis, powertrain and body sheet metal groups. In addition, any PD process would benefit from upfront tradeoffs and standardization, including consumer and retail goods.

7. Conclusions

The 7-step approach of using the DSM, process simulations and the DFC was quite successful in accelerating the PD process. The largest, incremental improvements (up to ~60%) came from design standardization, also seen at other automakers with significantly shorter PD lead-times. At the same time, customer satisfaction was improved (warranty claim reductions), proving false any myth that "accelerating the PD process would negatively affect customer satisfaction". Apart from standardization, better knowledge management and tradeoff tools helped. The findings are summarized in table 3, below:

(Continued on page 17)

CALL FOR PAPERS: OPERATIONS MANAGEMENT IN HEALTHCARE

(Continued from page 16)

Process type (With process improvements)	Average duration Work-months	Incremental improvement Percent
Current, as-is closures PD	185	–
Prioritized standardization from tearing	143	23
Complete standardization of main bottlenecks	85	41
Enhanced knowledge management for door PD	64	25
Better tools for attribute prediction and testing	49	23

Table 3: Summary of key improvements implemented in the design processes

It would be interesting to assess how successful the automaker was in rolling out the acceleration approach to other systems and car programs.

In the current economic environment faced by US automakers, it is even more critical to transform product development processes to be lean and agile. Using the 7-step approach can help make the case for such efforts, as well as direct the key changes required.

For more details, please visit www.dsmweb.org.

Excel macros available on www.dsmweb.org

References

Calvano, C. N., John, P., "Systems Engineering in an Age of Complexity", *Systems Engineering*, Volume 7, Issue 1, Wiley Periodicals: 2003, 25-34

Clark K.B., and Fujimoto, T., *Product development performance: strategy, organization, and management in the world auto industry* Harvard Business School Press, Boston, MA: 1991

Cusamano, M.A., Nobeoka, K., *Thinking beyond lean: how multi-project management is transforming product development and Toyota and other companies*, The Free press, New York: 1998

Eppinger, S.D., Ulrich, K.T., *Product Design and Development*, 2nd ed., The McGrawHill Companies, New York, NY: 2000

Morgan J.M., "High Performance Product Development: A Systems Approach to Lean Product Development Process", University of Michigan, Ann Arbor, MI: 2002

Noor, J. "A Comprehensive Approach to Complex System Product Development", Massachusetts Institute of Technology, Cambridge, MA: 2007

Ottino, J. M., "Engineering Complex Systems", *Nature*, Volume 427, Nature Publishing Group: January 2004, 399

Suh, NP., *Axiomatic Design: Advances and Applications*, Oxford University Press, New York: 2001

Whitney, D.E., *Mechanical Assemblies: Their Design, Manufacture and Role in Product Development*, Oxford University Press, New York: 2004

European Operations Management Assoc., EurOMA-2009

16th Annual Conference, Göteborg, Sweden, June 14-17, 2009

The Healthcare Operations Management Track is soliciting papers for presentation at **EurOMA-2009** that contribute to the advancement of healthcare system design, operations, and improvement. Research on Operations Management in Healthcare may draw from varied disciplines, such as operations and supply chain management, industrial engineering, information systems, strategy, performance management, quality, and technology management. Diverse but rigorous research methods are welcome, including empirical, analytical, numerical, and conceptual approaches. Sample topics include, but are not limited to:

- Measurement of organizational effectiveness and performance in healthcare.
- Managing organizational and technological change in healthcare settings.
- Supply chain management in the healthcare sector.
- Operations management's impact on cost and cost structures in healthcare.
- Safety management, quality management, and error reduction in healthcare delivery.
- The influence of organizational structure (e.g., service lines, nursing models) on healthcare effectiveness and efficiency.
- Justification and adoption of new technology in healthcare environments.
- Demand forecasting, resource planning, and scheduling in healthcare settings.
- Managing and improving patient flows.
- Operations management's contribution to patient satisfaction.

Contributors are invited to email extended abstracts (500-800 words) to the conference site, www.EurOMA2009.org, by **January 16th, 2009**. Indicate track name (Operations Management in Healthcare) and corresponding author. Abstracts will be blindly reviewed and evaluated based on the following criteria: Relevance, Clarity, Significance, Originality, Quality, and Impact.

Decisions regarding acceptance will be made by February 13th, 2009. Papers are accepted on the assumption that the manuscript is an original work and has not been copyrighted, published or accepted for presentation at other conferences. At least one author must register, attend the conference, and present the paper. Full papers (max length = 10 pages) must be received by April 17th, 2009. Accepted papers will be published in the Conference Proceedings.

Track organizers:

Urban Wemmerlöv, Erdman Center for Operations and Technology Management, School of Business, University of Wisconsin-Madison, USA (uwemmerlov@bus.wisc.edu) and Nancy Hyer, Owen School of Management, Vanderbilt University, USA (nancy.lea.hyer@owen.vanderbilt.edu).

WHO IS THE WINNER OF THE RFID BATTLE: MANUFACTURER OR RETAILER?



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Overview: Holiday season is right around the corner. Despite repeating news on the financial meltdown recently, many retail stores have long started to plan for the season. As most of us will be rushing to stores to put a smile on the faces of our loved-ones, retailers are worried about effects of operational inefficiencies that are elevated during such times. Some of us will leave a few items in wrong places and some objects will get stolen.

RFID (Radio Frequency Identification) is a technology that allows for seamless tracking of tagged objects. There is an ongoing argument among practitioners with regard to the main beneficiaries of this technology in supply chains. As detailed below, some people believe that the technology is most valuable to downstream players and some believe that incentives of the parties are actually aligned. Our research (with Jayashankar Swaminathan) shows that incentives of parties for investing in the technology are not perfectly aligned and that the upstream players can be the main beneficiaries.

Inventory misplacement and shrinkage: two major challenges for retailers during peak times

Inventory misplacement and shrinkage are considered among retailers' major inefficiencies. American Apparel has found that they had about 80 missing items on the sales floor at any time, which were subsequently found misplaced. According to a study conducted at a specialty retailer, 60% of the stock-outs were due to inventory misplacement. Retailers perform cycle counts and inventory audits as a remedy. However, surveys point out that stock-outs cause a significant fraction of customers to leave the store without making any purchase at all and that misplaced products do lead to lost sales.

Employee theft and shoplifting have been identified as the two main drivers of inventory shrinkage, which affect retailers on a large scale world-wide. In fact, they made up more than 75% of the shrinkage problem, which accounted for \$30 billion losses in the U.S.A. according to the National Retail Survey. Retailers often times report that sticky fingers are on the rise especially during peak demand seasons. Coupled with tough economic times, an increase in theft is anticipated during this holiday rush.

Technology to rescue: RFID

On top of tagging expenses, firms need to consider the upfront costs of deploying this technology. For instance, a typical consumer packaged goods manufacturer was estimated to spend about \$8 to \$13 million on fixed costs which would include system integration, changes to existing applications and storage of large volumes of data. Additionally, some of the auto dealers who have been trying out RFID told us that the resolution of the technology depended very much on the location and the number of readers. The more readers are positioned, the more precise will be the reading; hence, the higher will be the costs.

"Where is the real value for RFID? It is in retail store operations – preventing stock-outs and overstocks. Item-level tagging is required to get to the level of granularity needed to solve these

problems. It is not the cost of the tag that is holding up the acquisition of item-level data – once again, it is the cost of the infrastructure required to read the tags at the shelf"

Harley Feldman, President and CTO of Seeonic Inc.

A long-lasting debate: who will be the winner?

Despite high costs of adoption, while several big retailers (along with Wal-mart) have popularized RFID, a common opinion has been that the main beneficiaries of this technology will be downstream players, giving support to the argument that retailers are pushing reluctant manufacturers to adopt the technology. However, Kevin Ashton, co-founder of the Auto-ID Center at MIT, recently stated that Wal-mart started to see the promise of the technology after manufacturers such as Gillette and Proctor and Gamble have realized their own business case. Shortly thereafter, Dan Gilmore, the editor of Supply Chain Digest, responded to Mr. Ashton's point by arguing that it was the other way round.

The Italian subsidiary of Honda Motor Co. is among those manufacturers who have declared having seen benefits from their RFID experiments even beyond return on investment. On the other hand, Sam's Club (operated by Wal-mart) had to push its suppliers even stronger to comply with the RFID requirements by charging them a fee per untagged pallet at the beginning of this year. Additionally, while some firms have been very excited and optimistic about RFID, recent research presented by the Global Commerce Initiative showed that both retailers and suppliers are still skeptical about it.

Tell me the winner of RFID investments

We study the worst-case effects of the aforementioned two major operational inefficiencies using a stylized two-stage, single-period model. We consider both fixed and variable costs for item-level RFID implementation. Our work could be applicable to retailers such as toy stores and apparel stores during peak demand seasons when such operational inefficiencies hit them the most.

How should the parties in decentralized supply chains share the variable costs of the technology? Our results indicate that sharing the tagging expenses of the technology does not make a difference. Hence, as far as the tagging expenses are concerned, I quote:

"...Wal-mart knows that anything increases its suppliers' costs ultimately increases its own costs"

Kevin Ashton, Co-founder of Auto-ID Lab

Can there be a business case for manufacturers if there is no case for retailers or vice versa?

"...there is no business case for Wal-mart unless there is also one for its suppliers"

Kevin Ashton, Co-founder of Auto-ID Lab

"It depends" is the answer. When the parties are considered independent from each other, we derive expressions for the maximum tag price that is the maximum price of one RFID chip that each one can afford to benefit from RFID. An interesting point is that these thresholds are not the same. Thus, characterizing the incentives of

(Continued on page 19)

WHO IS THE WINNER OF THE RFID BATTLE: MANUFACTURER OR RETAILER? (CONT.)

(Continued from page 18)

the firms to adopt the technology in today's supply chains by an all-or-nothing scenario may lead to a partial representation of the problem.

We find that incentives of the parties can be characterized by three regions (see Figure 1). When supply chain partners share the costs, they are effectively sharing the fixed costs of investment as the suppliers can adjust their prices by their share of the tagging expenses. We identify a unique fraction representing the retailer's portion of the total fixed cost and we found this fraction to be less than 34% in some of our settings. If the retailer pays that amount as shown in Figure 1(a), it's a win-win or lose-lose situation depending on the value of the tag price. However, when this is not the case, an interesting situation arises as displayed by Figure 1(b) and Figure 1(c). When the tag price falls in the intermediate region, the RFID investment benefits only one while leaving the other one at a loss. In fact, despite the belief in the popular press, the only beneficiary is the manufacturer if the retailer's portion of the total fixed cost is higher than the unique fraction we found.

Why is American Apparel so excited about item-level RFID?

The maximum affordable tag price, which we derive for a vertically integrated firm to benefit from this technology, increases as the margin of the product increases when the existing inventory availability level is sufficiently low. Further, a vertically integrated supply chain always affords higher costs of investment than a decentralized supply chain. Our findings may bring an explanation to why centralized fashion firms such as American Apparel – where items can be considered as high margin and where inventory misplacement and shrinkage are of great concern – are very excited about item-level RFID. One detail our results point out is that excluding the fixed cost of investment from the analysis of such systems may cause misleading conclusions.

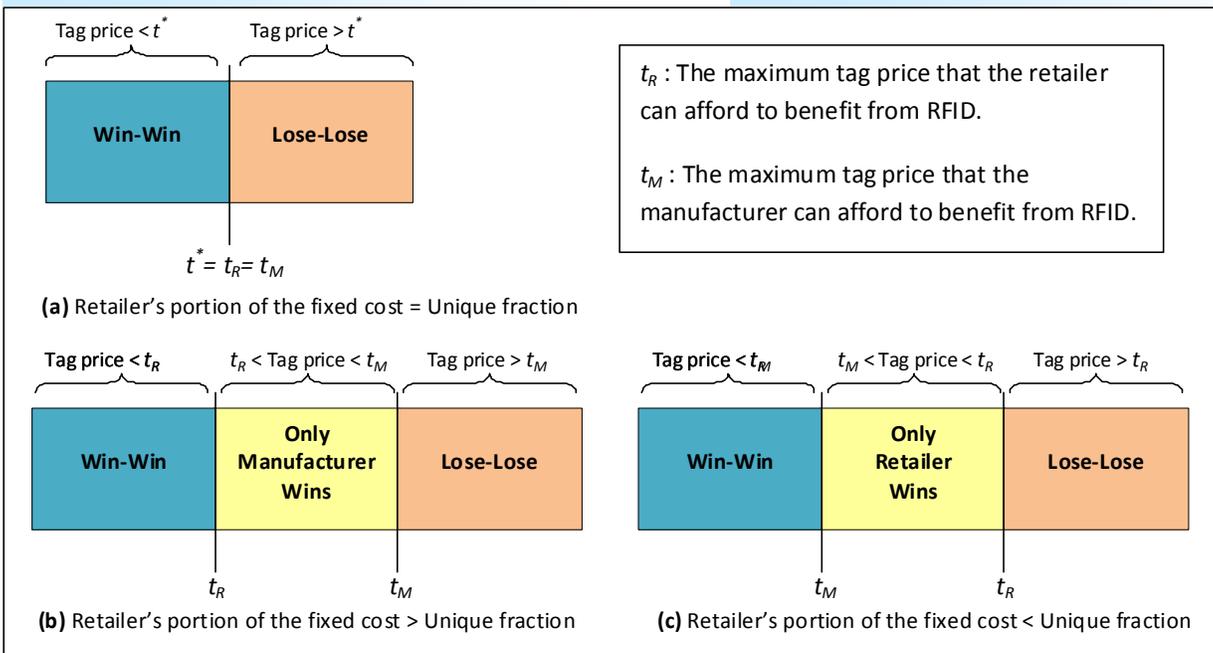
Conclusion

While practitioners continue their debates over the winners and the losers of RFID, more and more companies are experimenting with it. We find that arrangement of incentives of retailers and manufacturers can result in win-win, lose-lose or win-lose scenarios. One of the reasons for firms to participate in such programs is to keep the other party's business even when they are not willing to adopt the technology. Finally, it is worth noting that we concentrated our attention on suppliers who slap-and-ship, limiting the potential benefits of the technology to find "phantom inventory" or reduce theft. However, RFID can be employed in quite a wide range of applications from process improvement and asset tracking to people tracking. It is crucial for each company to determine its tipping point in deciding the range and the depth of RFID deployment because the depth of deployment, associated costs and the potential benefits are all increasing in the same direction.

DeHoratius, N. and Z. Ton. 2008. The Role of Execution in Managing Product Availability. Chap. 4 in *Retail Supply Chain Management*, edited by Narendra Agarwal and Stephen Smith. International Series in Operations Research & Management. Springer.

Asif, Z., M. Mandviwalla. 2005. Integrating the Supply Chain with RFID: a Technical and Business Analysis. Communications of the Association for Information Systems, 15, p. 393.

Figure 1 (below): Who benefits from the RFID implementation?



20TH ANNUAL CONFERENCE, MAY 1-4, 2009, ORLANDO, FLORIDA



General Chair

F. Robert Jacobs

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Program Chair

Kyle Cattani

kcattani@indiana.edu

We invite you to participate in the 2009 Annual Conference of POMS, to be held on May 1-4 in Orlando, Florida at The Buena Vista Palace Hotel & Spa. The hotel is located in *the Walt Disney World Resort* directly across the street from Downtown Disney with easy access to all the Disney attractions.

Given the global reach of POMS members the theme of this year's conference is *Global Challenges and Opportunities*. It is exciting how POMS has evolved into a global community of academics with a strong common interest in Operations and Supply Chain Management. The theme underscores that our purpose with the conference is to share ideas on how to address the challenges and opportunities presented by business today in a global setting. Our hope is that the 2009 conference will be a showcase of relevant research that addresses these challenges and opportunities in our production and operations management context.

We have organized the conference into 27 tracks (see list at right) and have over 50 track chairs who will work at developing the sessions for this year's conference. We encourage you to participate in the conference by presenting a paper, organizing a session, or participating in activities such as the doctoral consortium, emerging scholars program, workshops and other sponsored sessions.



All of the information needed to submit your contribution, register for the conference and secure hotel registration is contained on the conference website at: <http://www.poms.org>.

We encourage you to plan a fun trip to Disney, bring your families and friends and enjoy your time at this world class venue.

We look forward to seeing you in Orlando in May.

Emerging Scholars Program: Jack Kanet, U. of Dayton.

Doctorial Consortium: Ken Klassen, U. of Waterloo.

Tracks and Track Chairs:

1. **Benchmarking, Performance Measurement and Improving Supply Chain Performance:** Dana Johnson
2. **Disaster Management:** Marty Starr, Sushil Gupta
3. **Educational Issues in Operations Management:** Paul Schikora, Doug Moodie
4. **Empirical Research in Operations Management:** Carol Prahinski, Gopesh Anand
5. **Facility Logistics:** Rene de Koster
6. **Global Supply Network Security:** Batoul Modarress
7. **Healthcare Operations:** Craig Froehle, Vikram Tiwara
8. **Human Behavior and Behavioral Dynamics in Operations Management:** Elliott Bendoly, Henrique Correa
9. **International and Global Operations:** Doug Moodie
10. **Inventory Management:** Metin Cakanyildirim, Greg Graman
11. **JIT & Lean Systems:** Rachna Shah, Kevin Watson
12. **Logistics Applications in the Public Sector:** Martha Cooper, Pam Donovan
13. **Logistics Management:** Gene Tyworth, Jack Crumbly
14. **Managing Disruptions in the Supply Chain:** Kathy Stecke, Tom Schmitt, Sanjay Kumar
15. **Operational Advantage Group:** Rafael Menda
16. **Operations Management/Marketing Interface:** Kathy Stecke, Xuying Zhao
17. **Product Innovation and Technology Management:** Kaushik Sengupta, Tyson Browning
18. **Project Management and Econometric:** Larry White
19. **Purchasing:** Tobias Schoenher, Sachin Modi
20. **Quality Management:** Don Wardell, Robert Vokurka
21. **Role of Technologies in Global Supply Chains:** Pedro Reyes
22. **Service Operations:** Rich Metters, Larry Menor
23. **Strategic Sourcing:** Marco Busi
24. **Supply and Value Chain Networks:** Ben Clegg, Stan Griffis
25. **Supply Chain Management:** Amit Eynan, Kelly Weeks
26. **Sustainable Operations & Closed Loop Supply Chains:** Ravi Subramanian, Atalay Atasu
27. **Latin America and Caribbean:** Afonso Fleury



20TH ANNUAL CONFERENCE, MAY 1-4, 2009, ORLANDO, FLORIDA (CONTINUED)

Going Green in Orlando

By Jim Gilbert, VP Meetings

Our 2009 conference hotel in Orlando is a recipient of the Florida Green Lodging Program certificate. As we plan our conferences your planning team is very aware of the importance of sustainable operations within our conference hotel. The **Buena Vista Palace Hotel & Spa** fully recognizes the importance of keeping the environment healthy. The hotel's environmental efforts include:

- Linen reuse and newspaper recycling in all guestrooms
- Recycling paper, cans, and bottles in all meeting and banquet rooms
- Water saving showerheads, sink valves and toilets in all guestrooms
- Compact fluorescent bulbs in all guestrooms that allow this type of bulb
- Digital climate control in all guestrooms with pre-set temperature ranges
- Guestroom air filters changed every 90 days
- All cardboard, wood pallets and cooking grease is recycled
- Leftover produce and food scraps are given to a pig farmer for hog feed
- Recycling receptacles in public areas for paper, cans, and bottles
- Energy Management System for public areas, which ensures lights and air conditioning are turned off for spaces not in use
- Fluorescent bulbs in many public areas, which are on auto shut-off sensor control

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2010 POMS International Conference Site

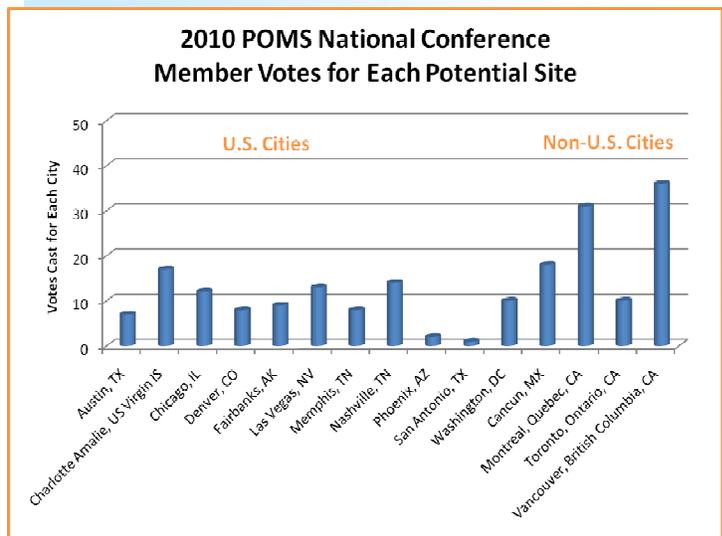
Jim Gilbert, VP Meetings
Crummer Graduate School, of Business
Rollins College

A few months ago I asked POMS members to get involved in the city selection for our 21st Annual POMS International Conference in 2010. After a comprehensive review of professional societies to which POMS members are likely to belong and related meeting cities I looked at general lists of the most popular conference cities to help focus our thinking. I then developed a map illustrating conference cities that POMS might select that are not immediately following another national society conference. This list was discussed with the POMS Board members at our May 2008 meeting.

After discussions with Sushil Gupta, our Executive Director, a list of potential cities for our 2010 conference was developed. Our members were asked in an e-mail survey to participate in the selection process by indicating two of the cities as their favorites and sharing their reasoning for selecting each city. One hundred and five POMS members elected to participate and their votes are illustrated in the figure below.

There is a clear desire by our POMS members to focus on Canada—specifically Vancouver, British Columbia and Montréal, Quebec. In a second survey of POMS members I asked about the best dates for the 2010 conference. The most popular dates are May 7 – 10, 2010.

As this issue of the *POMS Chronicle* goes to press we are looking at both Vancouver and Montréal hotels to locate the premier site for our 21st annual conference. Thanks so much for your help!



MINING FOR MEANING: THE USE OF CONTENT ANALYSIS IN OP'S MGT RESEARCH



By Jane Davies
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Content analysis is a multi-purpose research method developed specifically for investigating any problem in which the content of communication serves as the basis of inference (Holsti, 1969). For many purposes, insight into meanings can be obtained by examining the profile of ideas and the supporting information contained in text. Most of the available information on a company is in the form of documents, reports, manuals, web pages, e-mails, etc. In fact, a recent study indicated that 80% of a company's available information is contained in text (Tan, 1999). Typically such textual information is unstructured and extracting meaningful information can be time-consuming and difficult. Content analysis classifies this textual material, reducing it to more relevant, manageable pieces of data. Due to the fact that it can be applied to examine any piece of writing or occurrence of recorded communication, content analysis has been frequently used by social scientists in order to make sense of historical documents, newspaper stories, political speeches, open ended interviews, psychological diaries or official publications (Weber, 1990). However, examples of studies using content analysis in operations management are rare.

The purpose of this article is to highlight to readers the potential usefulness of content analysis as a methodology for operations management research. Firstly, a definition and brief history of content analysis is provided. Next, examples of management studies that employ content analysis are presented, followed by a summary procedure for conducting a content analysis study. The procedure is followed a discussion of software tools available for analyzing content. The advantages and limitations associated with the method are summarized. Finally, the role of content analysis in future operations management research is considered.

Definition of Content Analysis. According to Holsti (1969) content analysis is "any technique for making inferences by objectively and systematically identifying specified characteristics of message." It is used to determine the presence of certain words, concepts, themes, or phrases within texts and to quantify their presence in an objective manner. It has strict procedures and criteria for selecting data, and the inclusion and exclusion of content is done systematically according to consistently applied rules.

Brief History. The term content analysis was coined about 60 years ago. However, the first documented use occurred in 18th-century Sweden where religious symbols appearing in different hymn books were counted and compared. Up to the beginning of World War II, content analysis had largely been concerned with identifying opinions and attitudes in methods of mass communication such as newspapers and public broadcasts. During the war, content analysis received a major impetus through its use for analyzing propaganda material; it's first large scale practical application. The often large amounts of text to be analyzed and the repetitive nature of the task made this method ideal for computer automation. Consequently, the introduction of computers, document readable devices (scanners) and text analysis software have created a renewed interest in content analysis for a wide range of social science questions (Krippendorff, 1980). Berelson (1952) provides the following examples of the uses of content analysis:

- Reveal international differences in communication content
- Detect the existence of propaganda
- Identify the intentions, focus or communication trends of an individual, group or institution
- Describe attitudinal and behavioral responses to communications
- Determine psychological or emotional state of persons or groups

In the 1980s content analysis gained its legitimacy as a methodology in the field of management. Management research has utilized the technique primarily to draw valid inferences from the textual communications of managers (D'Aveni & MacMillan, 1990) and for the systematic analysis of the information contained in corporate documents (Bowman, 1984).

Examples of Content Analysis in Management Research.

There are a few studies in operations management that have relied on content analysis. Kellogg and Chase (1995) employed content analysis to derive a construct for customer contact. Hendricks and Singhal (1997) search for key words in corporate news announcements to identify operational events. More recently, Montabon, Sroufe and Narasimhan (2007) investigated the relationship between firms' environmental management practices and firm performance by content analyzing corporate environmental reports. However, in general content analysis has been used sparingly by operations management researchers.

On the other hand, content analysis has been firmly established as a methodological tool in other management disciplines. Meindl, Ehrlich, & Dukerich (1985) used content analysis to investigate the notion of organization leadership. In the marketing literature, Kassarian (1977) led the way with an exposition of content analysis in consumer behavior research. It has also been used for elaborating management theories (Sonpar & Golden-Biddle, 2008). Peslak (2005) used content analysis of annual reports as part of his study on the relative importance of information technology. Likewise, accounting researchers have long used content analysis on annual reports, for example Beaver (1968).

A Summary of the Content Analysis Procedure. Content analysis is particularly useful for those who want to enumerate qualitative data to help establish frequencies and relationships, yet it still possesses some of the advantages generally associated with qualitative methods such as richer detail, preservation of greater context information.

The first step in a content analysis study is to identify the constructs required for answering the research question. These constructs should be identified with a theoretical purpose and a consideration of why the count of associated words or phrases would represent a suitable measure of the construct. The development of constructs without theoretical rationale risks the content analysis becoming just "word crunching" (Insch & Moore, 1997). The researcher should next consider the selection of the text to be analyzed and whether the

(Continued on page 23)

MINING FOR MEANING: THE USE OF CONTENT ANALYSIS IN OP'S MGT RESEARCH (CONT.)

(Continued from page 22)

source of the information is appropriate to capture the constructs of interest and to answer the research questions.

The researcher should next assess the face validity of the words or phrases assigned to reflect the concepts. Also, decision rules concerning the handling of any homograph, idioms, pronouns and ambiguous phrases should be defined. The selected words and phrases are then collated to form a content analysis dictionary. The next step is to pretest the content analysis dictionary. The researcher should identify a sample of text, then analyze it to test the lucidity and completeness of the dictionary. This pretest phase is crucial as it can highlight interpretation issues, the practicality of the decision rules and the appropriateness of text selection.

The researcher should review the results of the pretest and assess them for semantic validity, stability reliability and reproducibility reliability. Semantic validity exists when persons familiar with the texts examine the words and phrases and agree that they represent the constructs. Stability refers to the tendency for manual coders to consistently re-code the same data in the same way over a period of time. Reproducibility is the tendency for a group of coders to classify words or phrases in the same way (Krippendorff, 1980). Computerized analysis removes the risk of unreliability by insuring that the classification rules are always applied in the same way.

These prior steps represent an iterative process to be repeated until the classification appears to be robust. This process is likely to be the most time-consuming element of a study using content analysis. However, repeating the pretest-refine procedure until a reliable classification system is produced can considerably reduce the time spent on analyzing the full text set. The use of computers can also ease the burden of collection and classifying the text. Once the full set of texts has been analyzed the results of the classification should still be checked to insure that the decision rules were applied correctly.

The content analysis constructs are valid to the extent that it measures the construct the investigator intends to measure. Problems with validity occur due to the ambiguity of word meanings and variable definitions. The researcher should check that the construct correlates with other similar measures of this construct and that it is uncorrelated with measures of dissimilar constructs.

The results of the content analysis are counts of occurrences, indices, or percentages, where a wide range of statistical techniques are available. The selection of the data analysis technique will depend upon the purpose of the study. See Weber (1990) for a fuller description of the content analysis procedure.

Software Tools for Content Analysis. Extracting the necessary words or phrases from unstructured textual information can be quite difficult and time-consuming. In a similar manner to data mining, which discovers patterns in structured databases, text mining software extracts information and patterns from unstructured text.

The software allows for automatic categorization and rigorous analysis of vast amounts of textual data. The main features of text mining tools used for content analysis are:

- Frequency analysis - provides a count of the occurrence of the words or phrases in the text (see Table 1 for example output from a frequency analysis of operational choices in company reports).
- Keyword-in-context (KWIC) - allows users to see all occurrences of a word or category in the original text. Users can look for similarities or differences in word usage, as well as inconsistencies in word meanings. Any discrepancies in usage can then be addressed by refining the dictionary.
- Categorization Dictionary - users populate the inclusion dictionary with the words and phrases under consideration, and update the exclusion dictionary for terms to discount.
- Crosstab analysis - users can crosstab keywords with other categorical variables of interest to uncover patterns in the data (see Table 2 for example output from a crosstab analysis of operational choice keywords by company).

Two text mining packages specially designed for content analysis studies are WordStat, developed by Provalis Research and SAS TextMiner, a product of SAS.

Table 1. Frequency Analysis of Operational Choices in Firm Reports

Operational Choices	Frequency of keyword	% of Total Words	Number of Cases with Keyword	% of Cases	Term - Document Frequency
Complementary Technologies	2	0.2%	2	4.0%	3.9
Customized	55	5.5%	34	68.0%	39
Excess Capacity	6	0.6%	6	12.0%	8.8
Excess Inventories	1	0.1%	1	2.0%	2.2
JIT	16	1.6%	11	22.0%	19.2
Lean	15	1.5%	10	20.0%	18.6
Modular	53	5.3%	25	50.0%	44.7
Quick Response	6	0.6%	5	10.0%	9.2

Table 2. Crosstab Analysis of Operational Choices Keywords by Firm

Operational Choices	Company									
	1	2	3	4	5	6	7	8	9	10
Complementary Technologies		1								
Customize	1		2			3		3		1
Excess Capacity					1			1		
Excess Inventories				3					1	
JIT	1						2			
Lean							2			1
Modular		2								
Quick Response			1			2				

Advantages and Limitations of Content Analysis. As is in the case of all research methodologies, content analysis has its strengths and limitations.

Content analysis offers several advantages to researchers who consider using it. First, content analysis allows for the examination of rich communication data collected in an unobtrusive manner. This unobtrusiveness is particularly valuable in situations where direct methods of inquiry might yield biased responses. Being nonintrusive is particularly relevant to management research where access to informants is often a serious issue. An appealing aspect of content analysis is its ability to capture a richer sense of concepts due to its qualitative basis while, at the same time, being amenable to quantitative data analysis techniques.

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MINING FOR MEANING: THE USE OF CONTENT ANALYSIS IN OP'S MGT RESEARCH (CONT.)

(Continued from page 23)

While content analysis is commonly applied to archival data, it can also be used on data collected in an experimental or other controlled setting (although the advantage of being nonintrusive does not apply to interviews or open-ended responses to surveys). Longitudinal research designs can be implemented due to the availability of comparable corporate information through time, such as annual reports or trade magazines. Multiple sources of data can serve as inputs to content analysis, both internal and external to the firm.

Several additional methodological and practical benefits have been noted in implementing content analysis. When computer software is used to classify the text (rather than manual coding), content analysis has an extremely high reliability of measurement permitting achievement of perfect reproducibility (inter-rater) reliability and perfect stability (test-retest) reliability. Further, content analysis can be used in conjunction with other methods for the purpose of triangulation.

Potential areas of concern in the use of content analysis generally relate to the biases that can be introduced through the values and interests of the researcher. One source of bias is the researcher's selection of the constructs and texts to be analyzed. Such decisions should be guided by the research question, hypotheses and underlying theory.

Another general criticism of content analysis is that it extracts sparse data from the richness of its context, and also the use of inferential procedures makes the conclusions open to challenge. Concerns along these lines include:

- Whether it is meaningful to count all occurrences as being of equal value, for example, can the second occurrence of a word carry equal weight as the ninety-ninth,
- Ignoring the value of what is not included, such as the potential for insensitivity to irony and sarcasm,
- The inability to interpret truth and intent (Krippendorff, 1980).

Content analysis also yields categorical data which may be less sensitive to subtleties in communications than data obtained using scales with other research methods.

Finally, despite the automation of data collection content analysis can be time consuming due to the necessary iterative nature of the process.

Application for future research in Operations Management

As discussed earlier, most of the publicly available information on a company is in text form, be it documents, reports, web pages, etc., and the amount and the accessibility of this information is constantly increasing. Content analysis provides a valuable methodology for leveraging this rich data source and enabling exploration of a variety of important but potentially difficult to study questions of interest to operations management researchers. For example,

- Annual reports could be examined to determine structural and infrastructural choices and link to the financial performance of the firm.

- Supply chain contracts could be classified to discover the key constructs of importance to managers.
- Customer feedback websites could be content analyzed to identify and quantify quality of service dimensions.

Content analysis can also provide a means to triangulate other studies and mitigate method bias. It can be used to draw out common themes from existing cases published in operations management, or analyze open ended survey research questions. Exploring textual data can also complement existing empirical methods more familiar to operations management researchers, such as econometric analysis or simulation.

In conclusion, content analysis can be employed whenever textual evidence is available and it is a useful tool for operations management researchers who wish to examine and quantify the meaning contained in that text.

References

- Beaver, W. H. 1968. The information content of annual earnings announcements. *Journal of Accounting Research*, 6(3): 67-92.
- Berelson, B. 1952. *Content analysis in communication research*. New York, NY: The Free Press.
- Bowman, E. H. 1984. Content analysis of annual reports for corporate strategy and risk. *Interfaces*, 14(1): 61-71.
- D'Aveni, R. A., & MacMillan, I. C. 1990. Crisis and the content of managerial communications: A study of the focus of attention of top managers in surviving and failing firms. *Administrative Science Quarterly*, 35(4): 634-657.
- Hendricks, K. B., & Singhal, V. R. 1997. Delays in new product introductions and the market value of the firm: The consequences of being late to the market. *Management Science*, 43(4): 422-436.
- Holsti, O. R. 1969. *Content analysis for the social sciences and humanities*. Reading, MA: Addison-Wesley Publishing Company Inc.
- Insch, G. S., & Moore, J. E. 1997. Content analysis in leadership research: Examples. *Leadership Quarterly*, 8(1): 1.
- Kassarjian, H. H. 1977. Content analysis in consumer research. *Journal of Consumer Research*, 4(1): 8-18.
- Kellogg, D. L., & Chase, R. B. 1995. Constructing an empirically derived measure for customer contact. *Management Science*, 41(11): 1734-1750.
- Krippendorff, K. 1980. *Content analysis: An introduction to its method*. Beverly Hills, CA: Sage Publications Inc.
- Meindl, J. R., Ehrlich, S. B., & Dukerich, J. M. 1985. The romance of leadership. *Administrative Science Quarterly*, 30(1): 78-102.
- Montabon, F., Sroufe, R., & Narasimhan, R. 2007. An examination of corporate reporting, environmental management practices and firm performance. *Journal of Operations Management*, 25(5): 998-1014.
- Peslak, A. R. 2005. The importance of information technology: An empirical and longitudinal study of the annual reports of the 50 largest companies in the united states. *Journal of Computer Information Systems*, 45(3): 32-42.
- Sonpar, K., & Golden-Biddle, K. 2008. Using content analysis to elaborate adolescent theories of organization. *Organizational Research Methods*, 11(4): 795.
- Tan, A. H. 1999. Text mining: The state of the art and the challenges. *Proceedings of the PAKDD 1999 Workshop on Knowledge Discovery from Advanced Databases*: 65-70.
- Weber, R. P. 1990. *Basic content analysis*. Newbury Park, CA: Sage Publications Inc.

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