Practice-Focused Research in Operations Management

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2013 Winter Operations Conference, Utah
Outline

• History and motivation
• Rewards and challenges
• Good PI practices
• Practice-focused paper pitfalls
• Dissemination venues
Jan’s History of OM

Mathematics & Computer Science


Engineering (Military, Industrial, Telecom)


from Van Mieghem, J., “The 3 Rs of OM” (2012)

Microeconomics


Econometrics
Management Engineering and the OR Crisis

In World War II, OR originated as management engineering.

In the 1950s and 1960s, OR rapidly expanded in both directions, towards theory and practice.

The expansion has continued, but the middle ground of management engineering has been left behind.

from Corbett and van Vassenhove (1993)
OM Needs Practice-Focused Research

“...OR has been equated by managers to mathematical masturbation and to the absence of any substantive knowledge or understanding of organizations, institutions or their management. [...] The field’s introversion drove it into a catatonic state in which it died mercifully, but it has yet to be buried.”

Ackoff (1979, 1987) (1956 president of ORSA)

“Ignoring what made “old style OR” successful will split the profession into two largely independent parts, each struggling desperately for existence”

Rothkopf (1988)

“[...] operations management has had big ideas such as the industrial revolution, mass production, the assembly line, the Toyota Production System, and statistical process control. Yet these ideas have not come from academia.”

Fisher (2007)

“I would like to increase significantly the number of papers that report on innovative implementations of OM research to real problems or that rigorously document existing practice and demonstrate how current modeling approaches succeed or fail in practice. I believe that our field is in desperate need of such work.”

Graves (2009)
Benefits of Practice-Focused Research to OM Field

1. Engineering function: Develop practical solutions to important OM problems

2. Seed function: Identify and characterize important new phenomena, practices and research topics

3. Legitimation function: Demonstrate relevance of our field’s research output to practice
Hewlett-Packard

Sport Obermeyer


Zara

“[...] I have found that so much is learned during the implementation process that this itself constitutes a type of empirical research. During implementation you are forced to verify and refine the details of your model, so you evolve a very precise definition of how a particular operations function works.”

OM Research Communication / Legitimation

• Research papers, conferences?
• Teaching cases
• Popular and professional media coverage
• Online lectures (e.g. Henry Stuart Talks on Operations Strategy)
• Video documentation
Les mathématiques ont dopé les ventes des magasins Zara

SOPHIE FAT

DANS les années 1970, les mathématiques ont révolutionné la mode de la finance. Aujourd'hui, elles bouleversent de nouveau la distribution. A la tête de cette évolution, des jeunes mathématiciens qui utilisent leur savoir-faire pour résoudre les équations les plus complexes des entreprises, sistemis que ni les outils informatiques classiques ni les organisations humaines ne pouvaient à traiter efficacement.

L'un d'eux, Jérémie Galien, ingénieur des Mines français, enseigne la « gestion industrielle » à l'école de commerce du Massachusetts Institute of Technology, la MIT Sloan School of Management. « Ici, nous faisons de la neurologie industrielle », expliquait-il.

Exemple avec Felipe Caro (qui enseigne désormais à l'Université de Californie). Il s'est intéressé au groupe espagnol de distribution de vêtements Zara, présent dans 68 pays à travers le monde. En effet le seulement stamtement est compté par un styliste et celui où il arrive en rayon. Il ne se passe chez Zara que quatre à six semaines, contre six à neuf mois dans les groupes plus traditionnels. Les rayons chez Zara voient passer 13 000 références par saison, là où les autres boutiques n'en gèrent que quelques milliers. Autre particularité, dès qu'une taille standard manque dans une boutique Zara, toute la série est retirée du rayon pour ne pas décevoir ses clients.

La répartition des stocks est donc un enjeu crucial pour l'entreprise. Elle doit faire un sort que les vêtements, expédiés deux fois par semaine par deux entrepôts espagnols à mille boutiques dans le monde, arrivent là où les clientes les demandent.

En guise de thèse de doctorat, Felipe Caro a développé un modèle mathématique permettant d'optimiser cette répartition des stocks, en tenant compte des contraintes logistiques et de la demande des clientes, venant d'une boutique à l'autre. Il a envoyé sa thèse à Zara, qui a mobilisé deux chercheurs pour voir la lui présenter en détail. Le groupe a alors accepté d'expérimenter le modèle sur une partie de ses magasins. Le résultat a été assez spectaculaire : une augmentation de 3 à 4% des ventes. Le système a été décliné au groupe, dopant la chiffre d'affaires de quatre à cinq milliards d'euros. Sans bouleversement ! Une opération très bénéfique.

Zara a ouvert une autre mission aux chercheurs : mieux gérer les étiquettes de soldes. « Si vous demandez autant un pull à San Francisco qu'à New York, vous ne le vendez pas à New York où il fait chaud et vous vendez 10 euros par pull là-bas. » Il faut frapper à New York et moins à San Francisco », explique Jérémie Galien, convaincu qu'un modèle mathématique peut calculer tout cela au mieux. Le laboratoire de cet enseignant-chercheur travaille aussi avec Dell et Amazon, qui, comme Zara, financent des doctorants. En France, quelques grandes entreprises commencent à prendre contact avec lui.

Le Figaro, November 2007

Senken Shimbun, December 2007

Boston Herald, October 2007, CFO Magazine, April 2008; Global Logistics & Supply Chain Strategies, February 2008; Information Week, October 2007; Chain Store Age, December 2007;
Rewards

- Personal satisfaction from practical impact/relevance;
- Credibility with students and practitioners;
- Teaching/research synergy;
- Exposure (media, practitioners);
- Income?
- Journal review process?
Challenges

• Control and management complexity;
• Incentive alignment with practitioners:
  – Publication
  – Intellectual property
  – Nature of work and timeline
  – Willingness to experiment
• Access to executive sponsorship and IT resources;
• Rigorous impact measurement;
• Time-to-paper ratio?
• Research quality perception / career implications;
Some Good PI Practices

Before
• Leverage alumni network
• Discuss respective professional environments and incentives
• Recognize that some level of mutual trust is necessary
• Stay clear of lawyers (if/when you can)?
• Avoid costless exit / obtain skin in the game (if/when you can)

During
• Trojan horse strategy: leverage a student internship (resource, access to data, incentive alignment)
• Manage momentum perception, time commitment credit and fear of disappearing professor (team approach)

After
• Estimate, materialize and communicate impact/value
• Communicate with partner before public dissemination
Practice-Focused Paper Pitfalls

• Literature review
• Applicability discussion
  “A solution developed for a specific organization is likely not applicable elsewhere”
  versus
  “If there is an important new research area, it is likely to affect this environment”
• Performance benchmark
• Impact quantification and discussion
  – Before versus after (data against confounding factor hypothesis)
  – Model-based estimation (validation/predictive accuracy assessment)
  – Controlled experiment (learn from medicine)
Dissemination Venues

• Journals: M&SOM, Practice Section of Operations Research, Interfaces...

• Competitions: Edelman, Wagner, EURO Practice Award, Pricing and Revenue Mgt. Section Practice Award, Doing Good with Good OR...

• Conferences and workshops: INFORMS Practice (Spring) conference, MSOM SIG workshops, LBS workshop...
Global Dual Sourcing: Tailored Base Surge Allocation to Near and Offshore Production

Gad Allon (Northwestern University, Kellogg School of Management)
Cort S. Jacoby and Ruchir Nanda (Deloitte Consulting, Strategy & Operations/Consumer & Industrial Products)

Modeling Price Protection Contracts to Improve Distribution Channel Performance in IBM’s Extended Server Supply Chain

Markus Etter (IBM, Supply Chain Analytics and Architecture)
Roman Kapuscinski (University of Michigan, Stephen M. Ross School of Business)

Clearance Pricing Optimization at Zara

Felipe Caro (UCLA Anderson School of Management)
Jérémie Gallien (MIT Sloan School of Management)
Rodolfo Carboni (MIT LFMI/Zara Inditex)

Implementing the Guaranteed Service Model for Safety Stock Optimization at Procter and Gamble

Lydia Barrett (Procter & Gamble, Inventory Optimization)
John Neale (Boston University School of Management)
Sean Willems (Boston University School of Management and Optiant, Inc.)

Supporting a Bundling, Lane and Price Sheet Strategy for a Fortune 500 Industrial Manufacturer

Doug Petterson and Giulio Fenu (Caterpillar, Building Construction Products Division)
Sridhar Tayur (Carnegie Mellon University, Tepper School of Business)

Pool Points for Peeps: A Network Optimization Model for a Candy Supply Chain

Alan Sargent (Just Born Candy, Supply Chain/Logistics)
Lawrence V. Snyder (Lehigh University, Industrial and Systems Engineering)
The 2013 Deloitte Institute of Innovation & Entrepreneurship workshop at LBS will highlight successful collaborations between academic researchers and industry practitioners in the area of operational innovation, construed in a broad way. Its focus will be on high-quality, innovative and impactful work involving deep collaborations between academics and practitioners. This event should thus appeal to practitioners interested to apply cutting-edge academic knowledge to drive operational innovation in their organization, and operations management researchers seeking exposure to industry and high-quality collaborations with practitioners. The format will involve a single track of 45 minute presentations given jointly by an academic researcher and a practitioner, each followed by a 15 minute discussion.

Submission Guidelines
Please send an extended abstract of at most 2 pages to Vicki Sale [vsale@london.edu] by February 21, 2013. This abstract should describe the motivating context, the problem or question considered as well as the way in which it was solved or addressed and include a detailed discussion of impact, both realized and potential.

Timeline Summary
Submission deadline: February 21, 2013
Final notification of acceptance: March 8, 2013

Program Committee
Jérémie Gallien (LBS), Karan Girotra (INSEAD), Marcelo Olivares (Columbia), Kamalini Ramdas (LBS) and Jeff Skinner (DIIE)
M&SOM Special Issue on Practice-Focused Research

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Scope:
• Applications of advanced and/or innovative operations management methodologies to problems in practice, yielding significant and quantifiable benefits and/or related general managerial insights;
• Detailed and well-documented descriptions of innovative or prevalent industrial practices not yet described in the academic literature, along with a rigorous quantitative analysis of their rationale and/or relative impact;
• Empirical analyses of field data providing original and broadly generalizable insights on the relative effectiveness of different OM practices. Such data could include, for example, operational data, sales data, contract forms and/or customer perceptions and characteristics.

Timeline:
• Letters of intent due: April 15, 2013
• Feedback on letters of intent: June 2013
• Deadline for submission: January 31, 2014
• Target date for publication: June 2015
Conclusion

• Practice-focused research provides legitimacy and important new research topics to the OM field; personal satisfaction to (some) researchers; identity and integration

• Recent activity increase, many dissemination venues, publication quality standards increasingly explicit

• Difficult, time-consuming and uncertain endeavor presenting potential career risks