

# **ASU OPERATIONS MANAGEMENT REVIEW**

**Vol 1**

**Department of Supply Chain Management  
Arizona State University**

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AOR  
C/O Department of Supply Chain Management  
W. P. Carey School of Business  
300 E Lemon Street  
Tempe, AZ 85287

[www.asuomreview.com](http://www.asuomreview.com)

# PREFACE

Understanding, creating, and communicating knowledge ... three pillars of scholarship. This publication, prepared by a small group of dedicated and developing scholars, provides a concise and lucid view of 36 contributions to the operations management literature. It reflects a slice of content covered in a doctoral seminar. It illustrates a creative approach to reinforce learning from the seminar and to disseminate knowledge. I believe it will serve as a valuable resource to both researchers and practitioners. Enjoy!

– Dr. Scott Webster

A pleasant guide to the evolving field of research in Operations Management. It is timely – it incorporates most advanced research from premier research outlets. It is actionable – it highlights real-world examples and practical implications. It is delightful - advanced mathematical models have been deciphered in a reader-friendly way. A must read!

– Dr. Mei Li

The ASU Operations Management Review is an excellent compilation and summary of research publications covering emerging topics in operations management. I commend the group of doctoral students that initiated this excellent resource. Biannual updating of the book means that it stays relevant and topical. I highly recommend this book as a “go to” and “must have” resource for doctoral students,

researchers and practitioners that require quick understanding of the status of research and future research opportunities in OM.

– Dr. Adegoke Oke

This is an excellent, interesting read. It helps the reader to quickly find and better understand relevant, cutting edge operations research articles. The author interviews at the end are invaluable, allowing authors the rare opportunity to elaborate on what they have published, and help the reader to better understand what they have written. A great idea, flawlessly executed, and an excellent read. Bravo to the ASU Operations Management Review team!

– Dr. Zachary S. Rogers

This volume would have not been drafted without contribution of the director and editors. We would also like to extend our sincere gratitude and appreciation for all the hard work and dedication provided by the voluntary reviewers. These volunteers are Feng Cheng, Kang Hsu, Stanley Lim, Adegoke Oke, Iman Parsa, and Lina Wang.

This project is partially funded by the Department of Supply Chain Management at W. P. Carey School of Business, and special thanks to Dr. Mohan Gopalakrishnan for his support.

# INTRODUCTION

Since the genesis of operations management (OM), scholars have addressed managerial topics, emphasizing the relevance of their studies. Such effort has positioned operations management as an academic field renowned for its connection to practice. Given the research direction, the academic community has flourished in terms of the number of scholars, the volume of research outputs, and the diversity of research themes.

While we appreciate advances in OM by previous contributors, we face another challenge today. The continuous development in OM has led to a flood of new knowledge, which cannot be easily handled by a single research entity. In addition, the field has also deepened the depth of new knowledge, making it much more time-consuming to internalize the new knowledge than previously. Furthermore, real-world problems are becoming more complex and emerging more rapidly. These new challenges increase the friction between stakeholders in the field of operations management. Indeed, as we study OM and other relevant subjects, we consistently witness that stakeholders suffer from the burden of learning new knowledge. Despite the arduous learning process while floundering in the flood of cutting-edge knowledge from recent advances in academia, many graduate students often forget the details of the knowledge as they move onto the next stage of their academic careers. Likewise, although professors are the main entity of pioneering knowledge, many of them are repeatedly chased by their hectic schedules and

thus suffer from insufficient time to digest new knowledge. Meanwhile, practitioners frequently feel distant from academic advances because of the entry barrier intensified by far-reaching scientific advances. Looking back at how OM took place and how it contributes to the real world, one might question as to what the OM community should do to address this burden of new knowledge.

The vision of ASU OM Review (AOR) is to channel new knowledge learned by PhD students to stakeholders of OM. AOR helps its editors understand OM more comprehensively as they evaluate research, address relevant issues, and link new knowledge to real-world issues. Extensive and constructive reviews of AOR also assist peer researchers in navigating their research directions through the fresh eyes of AOR editors, especially in new research domains. Finally, reader-friendly and concise content of AOR eases the understanding of academic knowledge for practitioners, thus bridging the gap between practitioners and academic scholars.

To address and deliver the cutting-edge knowledge in OM, we selected and reviewed studies as follows:

1. Given the academic theme (e.g., service management), each editor (hereafter, “first editor”) independently searched, selected, and reviewed one academic paper published in one of the top OM journals between 2014 and 2018. The journals include *Decision Sciences*, *Journal*

*of Business Logistics, Journals of Operations Management, Operations Research, Journal of Supply Chain Management, Management Science, Manufacturing and Service Operations Management, and Production and Operations Management.* A few exceptional papers published other than these journals (e.g., *Strategic Management Journal*) were also included upon the prior permission of the director.

2. The initial reviews of the selected papers were presented and discussed by the editors in the PhD-level Operations Management seminar (SCM 791, Fall 2018).
3. At the end of the class, editors used the Delphi method to select papers eligible for more extensive reviews. The selection was based on the three-level rating schema; 0 = not recommendable; 1 = considerable; and 2 = strongly recommendable. After the initial vote, the director and editors discussed the voting results and criteria and voted again after the discussion. As a result, of the initial 72 papers in 12 topic areas, the top ranked 36 papers were selected.
4. In December 2018, the director evaluated the initial reviews by first editors and randomly assigned the reviews to the other editors (hereafter, “second editors”). Building upon the initial evaluation by the director, second editors individually re-framed the reviews to be more comprehensive and added related cases to the reviews.
5. Evaluation and iteration of reviews were conducted. First, the jointly constructed reviews by first and second editors were

evaluated by the two lead editors (i.e., Seongkyoon Jeong and Seth Washispack; hereafter, “co-editors-in-chief”). Second, the director assessed the evaluated reviews, added more comments, and returned them to the editors. Finally, using the evaluation notes by director and co-editors-in-chief, the first editors revised the reviews, and the second editors updated the cases. This iteration cycle was performed three times until May 2019.

6. After the iteration, external members (e.g., other faculty members) performed friendly reviews in each expertise area. In June 2019, the final reviews were drafted upon this additional review.
7. From January 2019 to June 2019, the co-editors-in-chief contacted the first authors of the papers, and asked questions regarding idea generation process, challenge during research, and future research plans. Of 36 authors, we received 18 responses to our questionnaires. The Q&A with authors were added at the end of each corresponding review.

The content is divided into several sections. Each section starts with a brief review of the topic area and lists reviewed papers. Each review introduces background and a real-world case, discusses key insights and remaining questions, explores related domains, and points out classical approaches and studies.

We hope AOR contributes to not only disseminating the cutting-edge academic knowledge in OM within and outside the academic community but also developing the collaborative understanding of recent advances in OM.



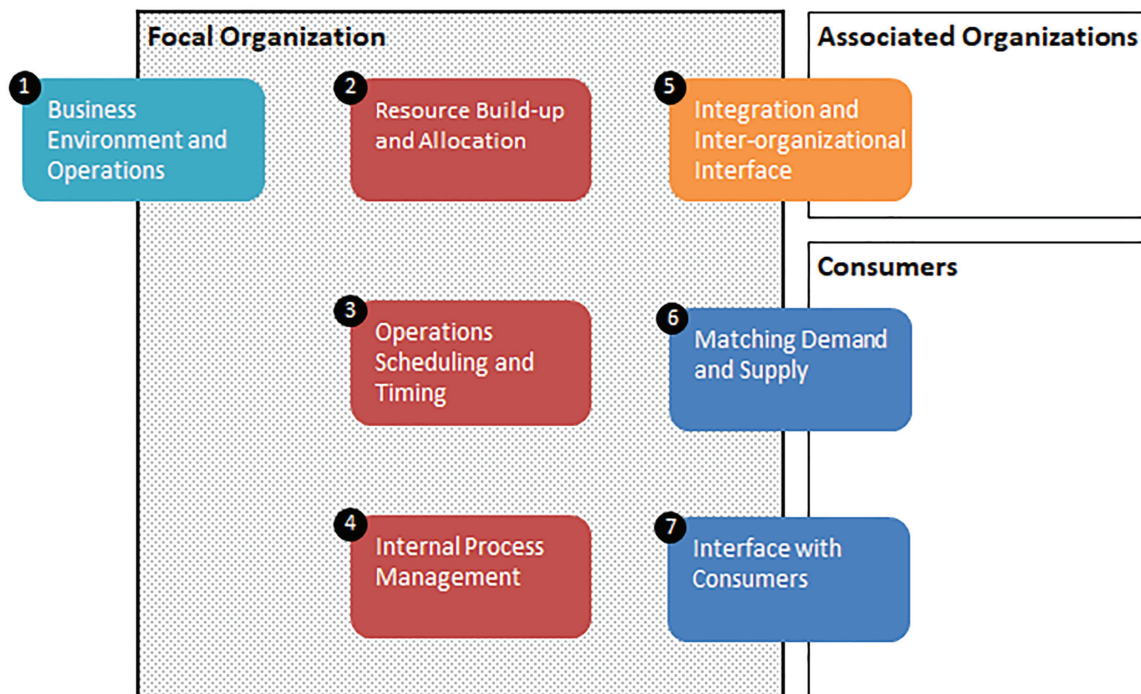
# FRAMEWORK

To increase readers' holistic understanding of operations management, AOR introduces reviews of recent studies using the following framework, as shown in the illustration below. We first categorize the reviews by the organizational boundaries of operations. In Section 1, we focus on the interface between focal organization and business environment such as competition in the industry. The subsequent sections (Sections 2, 3, and 4) address the management of internal operations such as resource build-up and allocation, scheduling and timing, and process management. Next (Section

5), we turn our attention to the areas of integration and inter-organizational interface. Finally, the last two sections (Sections 6 and 7) highlight how firms approach consumers, especially regarding matching demand and supply and interfacing with consumers.

Each section begins with a brief introduction of the section and a list of the reviewed studies. On the introduction page, AOR provides tags for the listed studies that inform readers about academic areas, research methods, and associated sectors to help the reader navigate the reviews.

## Business Environment





**The reviews are constructed in the following structure.**

**Background** explains why the research question is raised and why we need to pay attention to the research topic of the study.

**Mini Case** introduces practices and cases related to the research topic.

**Key Insights** summarizes the research approaches and the results of the study and suggests implications.

**Remaining Questions** discusses unaddressed but important questions associated with the study.

**Want to Know More?** expands our views on the research topic by introducing streams of relevant studies in other dimensions.

**Foundational Classical Studies** lists the classical studies that are used as foundations of the study.

**References** is the list of studies referred to by the reviews.

**Behind-the-Scenes** includes an interview with the authors of the study regarding the idea generation, research challenges, remaining research goals, and current ongoing studies.



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# **BUSINESS ENVIRONMENT AND OPERATIONS**

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The performance of operations is not solely determined by the focal organization's practice. Business entities compete with other entities over customer gain, product sales, and even resource acquirement. Thus, understanding the impact of business environment is an essential step in planning operations and setting operational goals. Classical studies typically focused on how business environment determines the price and service quality level, especially centering on competition. New emerging studies are exploring the impact of business environment in more diverse dimensions such as behavioral aspects (e.g., change in customers' sensitivity to quality and firm's inspiration due to relative performance) and strategic aspects (e.g., business network based human resource management and strategic investment and pricing). In this section, we review recent studies that highlight the new emerging perspectives bridging business environment and operations strategy.

## Topics in This Section

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### The Dark Side of Competition: Customers Become More Difficult to Satisfy

Based on Buell, R. W., Campbell, D., & Frei, F. X. (2016). How do customers respond to increased service quality competition? *Manufacturing & Service Operations Management*, 18(4), 585-607.

Service Management   Empirical Research   Financial Sector

### Combining Services and Products to Compete

Based on Guajardo, J. A., Cohen, M. A., & Netessine, S. (2015). Service competition and product quality in the US automobile industry. *Management Science*, 62(7), 1860-1877.

Service Management   Empirical Research   Manufacturing Sector

### Increasing Productivity: Hire Someone at Another Firm?

Based on Wu, L., Jin, F., & Hitt, L. M. (2017). Are all spillovers created equal? A network perspective on information technology labor movements. *Management Science*, 64(7), 2973-3468

Innovation Management   Empirical Research   IT Sector

### Is Competition Always Good?

Based on Wani, D., Malhotra, M., & Venkataraman, S. (2018). Impact of competition on process of care and resource investments. *Journal of Operations Management*, 57, 23-35.

Service Management   Empirical Research   Bio-medical Sector

### Actors in the Innovation Play: What's Their Motivation?

Based on Eggers, J. P., & Kaul, A. (2018). Motivation and ability? A behavioral perspective on the pursuit of radical invention in multi-technology incumbents. *Academy of Management Journal*, 61(1), 67-93.

Innovation Management   Empirical Research   Bio-medical Sector

# THE DARK SIDE OF COMPETITION: CUSTOMERS BECOME MORE DIFFICULT TO SATISFY

Based on Buell, R. W., Campbell, D., & Frei, F. X. (2016). How do customers respond to increased service quality competition? *Manufacturing & Service Operations Management*, 18(4), 585-607.

Review by Seongkyoon Jeong

## Background

Scholars have investigated the relationship between service quality, customer satisfaction, and customer retention extensively. The previous literature has found that one of the key drivers for the service quality level is competition, implying that an entry of a new service might induce improvement in service quality and increased defection of customers. Even though these relationships are well studied, the direct relationship between service quality and customer's reaction cannot be easily stated. There are several empirical challenges in revealing the link: 1) the need to observe relative service qualities between services, not average qualities, because customers do not sense the qualities in a precise and absolute scale; 2) the need to consider heterogeneous customers, studies should incorporate how an increase in competition brings out heterogeneous impact; and 3) the customer level satisfaction data should be merged with market level data for the analysis.

## Key Insights

When does increased service quality competition lead to customer defection? To answer the question, this research addresses the three above-mentioned challenges using novel data of nationwide US bank's customers and market-level competition.

Because customers do not fully grasp service quality in an absolute level across service providers in the market, they sort service providers in the evaluation of services (i.e., they compare service providers). Thus, given that service sensitive customers value the service quality gap between service providers, service quality sensitivity of customers is correlated with relative service quality position in the market. When customers defect, they follow similar quality providers with better options. In other words, customers who value quality are more likely to defect when a new service with higher quality enters. That is, the entry of a superior quality provider leads to customers' defection to the service. Likewise, price sensitive customers do the same when an inferior service quality provider enters the market. The authors predict there might be confounding effects in the relationship between customer profitability and the defection following the entrance of a competitor with high/low quality; yet, the results show that highly profitable customers are more likely to defect when the entry of a superior quality service provider occurs. Overall, this study shows that customers' satisfaction depends on the relative position of the service in the market and that their switching behavior is heterogeneous and driven by competitors that provide better prioritized options.



#### MINI CASE

## AFTER INTRODUCTION OF UBER IN CHICAGO, TAXI CUSTOMERS BECAME MORE SENSITIVE

It is no secret that taxi company profits have taken a major hit because of competition from ride-sharing services such as Uber and Lyft. Unlike taxi drivers, Uber drivers are evaluated right after rides. For that reason, they attempt to provide higher ride service quality not to mention a better economical price. Therefore, it would be no surprise if taxi drivers, in response to the increased competition, attempted to increase their service quality, in terms of driving pattern and manner toward passengers. In another light, because the relationship between a passenger and a cabbie is based on a one-time ride, there could be no incentive for taxi drivers to significantly improve service quality.

Either way, the service quality of taxi drivers would not be expected to decline drastically. However, interestingly enough, the number of complaints about taxi services in Chicago surged noticeably right after the introduction of Uber in 2011. In particular, passengers claimed more numbers of reckless driving. Why did the number of complaints increase despite the fact that taxi drivers might have been incentivized to improve their service quality?

Case: <https://www.theatlantic.com/business/archive/2015/07/uber-taxi-drivers-complaints-chicago-newyork/397931/>

Image: <https://pxhere.com/en/photo/99246>



## Remaining Questions

According to the paper, two competing theories exist over the relationship between high customer profitability and the likelihood that customers defect following the entrance of competitors with superior quality. The neglected theory that supports the negative relationship between the profitability and likelihood is based on the switching cost perspective. Old and wealthier customers or customers who use various offerings might face higher switching cost. One could argue that the theory itself is wrong, or the effect is overshadowed by the competing theory based on customer learning and service sensitivity. We cannot be sure either because the results do not measure profitability but use variables such as balance and tenure of service use. Although the data do not include such variables as age of customer, one might be able to investigate the effect of switching cost. Can we measure the link between switching cost and customer profitability? What variables would be good proxy for switching cost?

## Want to Know More?

What if a service is part of a bundle for a product? Then, what is the relationship between service

quality and product quality? How would customers respond to service quality? Guajardo et al. (2016) approach this question, using the data of the U.S. automobile industry. They found service quality and product quality have a complementary relationship. That is, customers demand high service quality to make up for low product quality. In addition, competition may drive a change in quality level. Can we model the competition in a game theoretic situation? Chiu et al. (2014) attempt to address this question assuming that firms attempt to maximize their market share under the condition of their given cost structure.

## Foundational Classical Studies

Customers have bounded rationality and do not have full market information. Classical modeling papers discuss the sorting effect (Gabszewicz and Thisse 1979, Shaked and Sutton 1982, Sutton 1986, Tirole 1990), on which the hypotheses of this study are based. Previous studies (Fitzsimmons et al., 2006; Israel 2005) argue that customers may not be fully capable of understanding the true service quality, unlike some modeling papers that assume perfect information (Tirole 1990).

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## BEHIND-THE-SCENES

## INTERVIEW WITH PROF. RYAN BUELL

**How did you come up with this idea?**

Practitioners are constantly responding to changing competitive dynamics in the markets where they serve customers, and although a wealth of theory existed on how customers should respond to service quality competition, surprisingly little research had been conducted on how customers actually respond to it.

**What was the biggest challenge in the research and revision?**

This project took seven years from start to its ultimate publication. The biggest initial challenge was how to collect data that would help us reliably identify the effect of service quality competition on customers, so that we could perform the analysis. During the review process, the biggest challenge was in reconciling the stylized theoretical models that had been put forward in earlier literatures with what we actually observed in practice. More theoretically-oriented reviewers wished to see us develop new economic models to motivate why we might expect to see the pattern of results we observed. However, we and the more empirically-oriented reviewers viewed the research to be more of an empirical question. Trying to please everyone led to a substantively poorer paper and a late-stage rejection at Management Science. However, that experience gave me the opportunity to rewrite the paper, incorporating the lessons we learned from the first review process, which ultimately led to a stronger and better article, and I believe, a more meaningful contribution.

**What are the main remaining missing puzzles in this area of research? If any, what is your subsequent, ongoing work in this area of research?**

One of the main puzzles that arose from this research, which has driven several ongoing projects, is that our results revealed how different customers can be attracted to different dimensions of a particular firm's service offerings. That means that in some markets, where the firm offers an above-average level of service, its customers are more likely to have selected it based on service quality and are more likely to have higher service expectations. In markets where it has a below-average level of service quality, its customers are more likely to have selected it based on price and are more likely to have lower service expectations. The results were suggestive to us that differences between the needs of customers and the capabilities of the operation serving them might be an important driver of differences in service performance, which is what some of my subsequent research with collaborators has revealed. For example, in one project, differences between customers is shown to explain roughly a quarter of the variance in customer satisfaction with a service firm. In another project, conducted as a field experiment, customers who are shown the trade-offs designed into a firm's service offering make better selection decisions and exhibit significantly higher long-term loyalty.

Buell, Ryan W., Dennis Campbell, and Frances X. Frei. "The Customer May Not Always Be Right: Customer Compatibility and Service Performance." Harvard Business School Working Paper, No. 16-091, February 2016. (Revised March 2018.)

Buell, Ryan W. and MoonSoo Choi. "How Operational Transparency Improves Customer Compatibility." Harvard Business School Working Paper. April 2019.

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# ABOUT EDITORS

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## CO-EDITOR-IN-CHIEF



**Seongkyoon Jeong**

Seongkyoon Jeong is a PhD student at Arizona State University. Prior to joining his PhD program, he worked for the Korean government as a researcher, planning R&D programs and evaluating organizational performance. His research lies in product and innovation management in the supply chain context. He holds Bachelor and Master of Science from Seoul National University and Master of Management from Georgia Institute of Technology.



**Seth Washispack**

Seth Washispack is a PhD student in Supply Chain Management at Arizona State University. His current research interests include empirically grounded work in socially responsible supply chains and supply chain performance. Recently, he published an article focusing on sustainable supply chain management in the Journal of Business Logistics. He received both his bachelor's in Biomedical Engineering and his MBA from the University of Arkansas.

## EDITOR



**Xiangjing (Olivia) Chen**

Xiangjing Chen is a PhD student in Supply Chain Management at the W.P. Carey School of business of Arizona State University (ASU). She received her bachelor's degrees in Economics, Accounting and Finance from Sichuan University in China and University of Minnesota respectively, and her master's degree in Business Analytics from ASU. Her currently research focuses on online retailing and pricing strategy. She also has research interests in supply chain risk management and logistics.

**M. Ryan Hatton**

Ryan Hatton is a PhD student in Supply Chain Management at Arizona State University. His current research interests include empirically grounded work in government purchasing operations and cooperative purchasing. Prior to joining the PhD program, he worked as Director of Technology for NASPO ValuePoint. He holds a Bachelor's degree in Economics from the University of California, Davis as well as an MBA from the University of Utah.

**Chao Wu**

Chao is a Ph.D. student in Arizona State University majoring in supply chain management. His current research interest is in mathematical modeling with humanitarian supply chain area. Chao has his master's in supply chain management from Washington University in St. Louis and bachelor's in both Economics and Accounting from Clarion University. He also worked in a leading Agri-science company for three and half years.

**DIRECTED BY****Yimin Wang**

Yimin Wang is an associate professor in the W. P. Carey School of Business at Arizona State University. He joined ASU in 2007. His research areas include supply chain risk management, global operations and revenue management. Among his current projects are efforts that examine operational improvement to mitigate supply risks and mitigating regulatory trade barriers. Prior to ASU, he served as a consultant with the SAS Institute and as project leader for Canadian Airlines International.

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