

Operations in the Service Industries: Introduction to the Special Issue

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This special issue of *Production and Operations Management* offers a sample of ongoing research that focuses currently on the services industries. The articles selected cover a spectrum of application areas as well as methodologies.

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1. Introduction

The service sector represents the largest and the fastest growing segment of the economies of the United States and other developed countries. For example, in 2006, services accounted for roughly 83% of the total employment in the United States. The sheer size and continuing growth of the service sector and of service occupations, the lack of significant productivity improvement within services, and a late start in the research on the operational issues of services make service operations an important and fertile area of research. Lately, there has been an increase in the research on service operations (Smith et al. 2007).

In 2002, the *College of Service Operations* (CSO) was launched within the Production and Operations Management Society (POMS) to address this need for research in service operations. The goals of CSO also include the development and nurturing of a community of scholars and practitioners who are interested in the research and teaching of service operations management. Activities of CSO that have been particularly useful in promoting research in service operations include organizing research conferences and guest editing special issues of *Production and Operations Management* focusing on service operations.

This special issue is a result of a conference that the POMS College of Service Operations held at Columbia University in December of 2004. The main organizer of the conference was Professor Nelson Fraiman from Columbia University. The conference was sponsored, in addition to the CSO of POMS, by the Graduate School of Business at Columbia, the Stern School of Business at NYU, the Wharton School

at the University of Pennsylvania, the School of Management at Yale, and IBM. Over 50 papers were presented covering all aspects of service operations. A number of papers from this conference were subsequently submitted to POMS for this special issue, and eight of the papers submitted were selected for publication.

2. Contents

Research in service operations can be classified in a variety of ways that either highlights its industry focus, the key underlying questions, or the methodological tools that are applied in each case. The papers in this special issue represent the spectrum of the areas and research disciplines spanned by the growing field of service operations. They include methodological papers as well as papers that are based on empirical research. (A significant amount of research over the last decade has indeed been based on empirical research; see Gupta et al. 2006.) The eight papers are grouped as follows.

The first two papers in this issue focus on the broader and more strategic issues in managing service operations. The paper by Spohrer and Maglio of IBM, entitled “The Emergence of Service Science: Toward Systematic Service Innovations to Accelerate Co-Creation of Value,” provides an industry perspective on issues related to service innovation. In their view, service innovations are going to play a critical role in fueling economic growth and raising the quality and productivity level in services in the future. This paper argues for the emergence of a service science—a new interdisciplinary area of study—to address the challenges that underlie the services industry.

The second paper, "Experience, Service Operations Strategy, and Services as Destinations: Foundations and Exploratory Investigation," by Voss et al. uses a multiple-case study approach to introduce the notion of experience-centric services and examines its implications on operations strategy. The authors assert that the new role of operations strategy is one of choreographing the service delivery system to create and deliver total experience for the customer. The paper offers a service operations strategy framework that comprises four management-controlled levers: stage-ware, orgware, linkware, and customerware.

The next two papers in this special issue focus on the financial services industries. The paper by Menor and Roth, "New Service Development Competence and Performance: An Empirical Investigation in Retail Banking," describes an empirical study on new service development (NSD) in retail banking. It finds that NSD depends on four inter-related and complementary factors, namely, (1) NSD strategy, (2) formalized NSD processes, (3) market acuity, and (4) information technology use and experience.

In their paper entitled "A Specialized Inventory Problem in Banks: Optimizing Retail Sweeps," Nair and Anderson study issues surrounding the management of retail deposit sweep programs in depository institutions. Deposits held at Federal Reserve banks represent an important component of the business activity of most depository institutions. Managing these deposits, however, is a complex and challenging issue, since the depository institution must follow statutory reserve requirements set by the Federal Reserve Bank while receiving no interest on such deposits. The paper uses a stochastic dynamic programming model to propose optimal policies for managing the sweep programs.

The following two papers focus on call center operations. Call centers are one of the most important channels through which firms interact with their customers, acting both as a service center and a point of sales. In addition, modern call centers employ millions of people worldwide, marking their socio-economic role in today's U.S. and global economies. The study of the economic and operational design and control of call centers is central to the field of service operations. A significant amount of research has focused in the past on call centers (see the excellent survey paper by Aksin et al. 2007). In this special issue, two central problems within this research area are being considered, namely, the effect of pooling in the design of such systems and the routing control problem in call centers with multiple agent pools with different skill sets.

When should the service system use one cross-trained pool of agents as opposed to multiple, dedicated groups of agents to handle its call traffic? van

Dijk and van der Sluis ("To Pool or Not to Pool in Call Centers") study this question and identify conditions in terms of the blend of demand rates and respective service times for the various types of calls that favor the use of cross-trained agents and a pooled system design.

Chevalier and Van den Schrieck ("Optimizing the Staffing and Routing of Small-Size Hierarchical Call Centers") study the staffing and routing control problems in small-scale call centers that handle multiple types of customers through many pools of agents with different skill levels. They propose a computational algorithm to find the optimal staffing and routing policy for small-scale call centers that optimizes the inherent trade-off between the gains resulting from pooling effects due to the use of cross-trained agents with the increased staffing costs of these agents.

Rabinovich et al. ("Assessing Markups, Service Quality, and Product Attributes in Music CDs' Internet Retailing") focus on the retail industry and, in particular, consider the effects of service quality on Internet commerce. Their paper investigates empirically the trade-offs between premiums, service quality, and product attributes in an Internet supply chain that consists of three echelons, namely, a customer, a retailer, and a wholesaler. They conclude that high margins are associated with superior performance by Internet retailers across several service quality dimensions; i.e., there is a service premium effect. Thus, when consumers shop for homogeneous goods on the Internet, they face a trade-off between retail premiums and service quality.

The last paper considers the health care industry. The health care sector is an important segment of the services industry. It is perhaps a worldwide phenomenon that health care delivery systems operate with constrained resources, often under inefficient protocols. Irrespective of the quality of the services rendered, their delivery tends to be characterized by long delays and poor patient experiences. Cayirli et al. ("Assessment Of Patient Classification in Appointment System Design") study the topical problem of patient classification and its impact on appointment system design. The typical performance measures of such systems involve the doctor's idle time, the doctor's overtime, and the patients' waiting times. The work by Cayirli et al. shows that classifying patients in terms of their anticipated needs and using that information in sequencing patients and allocating appointments intervals to them can have a dramatic effect on all of the above service measures.

3. Future Trends

Although it is hard to offer a comprehensive review of the evolving field of service operations within the

limits of this special issue, the scope of the papers published in this issue illustrate some of its diverse facets, including strategic and economic considerations, tactical operational control issues, and quantitative and data-driven analysis of operational heuristics. A fair amount of research has been done in the past on both the methodological front as well as on the empirical front (see the survey paper by Aksin et al. 2007 on call centers and the overview on empirical research by Gupta et al. 2006). Future work on services may well help fine-tune a unified services theory as originally proposed by Sampson and Froehle (2006).

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