Research Repository UCD

Title	Service operations: what's next?
Authors(s)	Field, Joy M., Victorino, Liana, Buell, Ryan W., Secchi, Enrico
Publication date	2018-01
Publication information	Field, Joy M., Liana Victorino, Ryan W. Buell, and Enrico Secchi. "Service Operations: What's Next?" Emerald, January 2018. https://doi.org/10.1108/JOSM-08-2017-0191.
Publisher	Emerald
Item record/more information	http://hdl.handle.net/10197/9987
Publisher's statement	This article is © Emerald Group Publishing and permission has been granted for this version to appear here http://researchrepository.ucd.ie. Emerald does not grant permission for this article to be further copied/distributed or hosted elsewhere without the express permission from Emerald Group Publishing Limited
Publisher's version (DOI)	10.1108/JOSM-08-2017-0191

Downloaded 2026-05-01 23:36:29

The UCD community has made this article openly available. Please share how this access benefits you. Your story matters! (@ucd_oa)

© Some rights reserved. For more information

Service Operations: What's Next?

Joy M. Field
fieldjo@bc.edu
Carroll School of Management, Boston College, Chestnut Hill, MA

Liana Victorino
lianav@uvic.ca
Peter B. Gustavson School of Business, University of Victoria, Victoria, BC, Canada

Ryan W. Buell
rbuell@hbs.edu
Harvard Business School, Cambridge, MA

Michael J. Dixon
mike.dixon@usu.edu
Jon M. Huntsman School of Business, Utah State University, Logan, UT

Susan M. Goldstein
meyer033@umn.edu
Carlson School of Management, University of Minnesota, Minneapolis, MN

Larry J. Menor
lmenor@ivey.uwo.ca
Ivey Business School, University of Western Ontario, London, Ontario, Canada

Madeleine E. Pullman
mpullman@pdx.edu
School of Business Administration, Portland State University, Portland, OR

Aleda V. Roth
aroth@clemson.edu
College of Business, Clemson University, Clemson, SC

Enrico Secchi
enrico.secchi@ucd.ie
School of Business, University College Dublin, Dublin, Ireland

Jie J. Zhang
jiezhang@uvic.ca
Peter B. Gustavson School of Business, University of Victoria, Victoria, BC, Canada

Last updated: November 15, 2017

Abstract

Purpose – The purpose of this article is to present exciting and innovative research questions in service operations that are aligned with eight key themes and related topics determined by the *Journal of Service Management* (*JOSM*) Service Operations Expert Research Panel. By offering a good number of such research questions, we provide a broad range of ideas to spur conceptual and empirical research related to service operations. As a result, we hope to encourage the continued creation of deep knowledge within the field, as well as collaborative research across disciplines that develop and incorporate insights from service operations.

Design/methodology/approach – Based on a Delphi study, described in the companion article, "Service Operations: What Have We Learned?," the panel identified eight key research themes in service operations where leading-edge research is being done or has yet to be done (Victorino, *et al*., 2018). In this article, we select three or four topics within each theme and propose multiple questions for each topic to guide research efforts. The topics and questions, while wide-ranging, are representative of the many ongoing research opportunities related to service operations.

Findings – The field of service operations has many interesting research topics and questions that are largely unexplored. Furthermore, these research areas are not only increasingly integrative across multiple themes within operations but often transcend functional disciplines. This creates opportunities for ever more impactful research with a greater reach throughout the service system and suggests that service researchers, regardless of functional affiliation, can contribute to the ongoing conversation on the role of service operations in value creation.

Originality/value – We leverage the collective knowledge of the *JOSM* Service Operations Expert Research Panel to elaborate on the research themes generated from the Delphi study and put forward novel questions for future study. Recognizing that the number of potential research questions is virtually unlimited, we also provide summary questions by theme and topic. These questions represent a synopsis of the individual questions and can serve as a quick reference guide for researchers interested in pursuing new directions in conceptual and empirical research in service operations. This summary also serves as a framework to facilitate the formulation of additional research topics and questions.

Keywords – Service operations, Service supply networks, Service operations performance, Customer and employee behavior in service operations, Servitization, Knowledge-based services, Participation roles and responsibilities, Sustainable services, Social impact services, Sharing economy

Paper type – Research paper

1. Introduction

In "Service Operations: What Have We Learned?" (Victorino *et al.*, 2018) a companion to this article, we describe the Delphi study performed by the *Journal of Service Management* (*JOSM*) Service Operations Expert Research Panel to identify eight themes in service operations where exciting and innovative conceptual and empirical work is being done. We then completed a systematic review of all articles previously published in *JOSM* between the years 1990 and 2016, mapping the articles classified as "Operations" to the eight themes and to an additional category that represents traditional manufacturing approaches applied in service settings. What we found was that a majority of the earlier operations articles aligned with traditional manufacturing approaches as applied to service operations, with an increasing percentage of articles over time falling into the eight themes. Yet, even as the content of the *JOSM* service operations articles trended toward these eight emerging areas, the overall percentage of service operations articles in *JOSM* has declined over the past decade. Thus, we wrote "Service Operations: What Have We Learned?" (Victorino *et al.*, 2018) and this article, "Service Operations: What's Next?," to inspire the research community to redouble its efforts to conduct leading-edge conceptual and empirical research in service operations and submit such work to service-oriented journals like *JOSM*.

The primary contribution of this article is to elaborate on the emerging research themes generated from the Delphi study and put forward specific questions to stimulate new ideas for conceptual and empirical service operations research. Specifically, an introduction to each theme is followed by a discussion of three to four key topics within the theme, including examples of research questions that are being studied or have yet to be explored. To

comprehensively review each theme, we broaden our view in this article to include not only JOSM articles but also research from other sources.

The topics within each theme were chosen based on ideas generated over the four rounds of the Delphi study, as follows: During each round of the Delphi study, the panel members offered detailed commentary on each proposed theme, including suggested topics to explore and questions to pose. Between the third and fourth rounds, we presented the themes in a session at the 2016 POMS conference that was attended by over sixty service operations academics. Their ideas on topics and research questions were included as inputs for Round 4. The feedback from the POMS session and all four rounds of the Delphi study was aggregated into a 30-page, single-spaced document that was distributed to the panel members. Within each theme, a sample of topics with high potential for impactful research was further developed by combining the content from the Delphi study and POMS session with a review of the relevant literature to identify questions that address gaps in our knowledge to help move the field forward.

Note that the themes themselves may not be new but are in areas where we see significant prospects for innovative research. In addition, the themes and topics are not intended to be an exhaustive list but instead are representative of the many ongoing research opportunities related to service operations. In the following sections, the themes are organized from the highest to the lowest prevalence of articles previously published in *JOSM* within that theme. We conclude with a summary of the future research opportunities presented in this article, which we hope will serve as a platform to support continued innovation in empirical and conceptual service operations research.

2. Theme #1: Service Supply Networks

Most service operations research focuses on the dyadic interaction between service delivery systems and customers, which is manifest in the service encounter, where the customer meets the service organization and the service outcome is realized (Bitner, 1990; Roth and Menor, 2003). Although dyadic interactions are undeniably a fundamental driver of service operations performance, a growing body of research highlights the performance implications of actors who would normally be considered external to a service encounter, such as other service providers concurrently used by the customer, infrastructure providers, suppliers, or other customers (Gummesson, 2008; Harvey, 2016; Tax *et al.*, 2013). Service research has seen a proliferation of new theoretical constructs that allow researchers and practitioners to account for the increasingly distributed nature of service delivery, such as service delivery networks (Tax *et al.*, 2013), collaborative networked organizations (Romero and Molina, 2011), service value networks (Haas *et al.*, 2013), and service ecosystems (Barile *et al.*, 2016). We refer to the set of entities that participate directly or indirectly in the realization of a service outcome with the label of Service Supply Network (SSN) (Sampson *et al.*, 2015).

The shift to a multi-centric view of service delivery involving a multitude of disparate actors has been recognized by modern theories of service design and management. Proponents of service-dominant logic have described this shift as a phase transition involving “a move toward a collaborative, service-dominant network" (Lusch *et al.*, 2010, p. 72). Similarly, Sampson and Froehle’s (2006) Unified Services Theory, along with the related Process-Chain-Network (PCN) analysis technique (Sampson, 2012a; 2012b), entails a shift from the analysis of

a single process flow unit to the network of activities and actors that interact and operate on resources to shape service outcomes. Although our understanding of SSNs is progressing rapidly, there are still several important areas of research that remain open for exploration, including frameworks for analyzing SSNs, coordination and governance of SSNs, and service failures in the SSN.

2.1 Frameworks for analyzing SSNs

Existing literature provides some guidelines to classify different types of SSNs (Ekman *et al*., 2016; Tax *et al.*, 2013). However, the service operations field still lacks a systematic and comprehensive framework to map and analyze SSNs as a basis to understand the operational implications of different network configurations. Beyond classification, researchers have suggested that participation in a network can significantly influence service outcomes (Black and Gallan, 2015) but the specific operational consequences of delivering a service as part of a network are unclear. In particular, one important unanswered question concerns the decision to be part of a network in the first place. When is relying on a network partner a better option than building the corresponding capability internally? To complicate this question, service providers sometimes do not have control over the choice of being part of a network, such as when customers assemble their own group of specialists to solve a particular problem (Sampson *et al.*, 2015). How can service providers manage the customer experience when they cannot choose their partners?

Answering these questions will likely require the development of new tools or the expanded use of currently available ones. PCN Analysis (Sampson, 2012a), social networks analysis (Gulati, 1998; Koza and Lewin, 1998; Li and Choi, 2009), and agent-based simulation

(Fioretti, 2013; Miller and Page, 2009) would all be prime candidates. In addition, how should researchers account for the temporal dimension of SSNs – both as the customer moves through the network and as the network itself changes? If, for example, researchers use customer satisfaction to measure the performance of the SSN, how does this performance outcome evolve over time as the customer traverses through the network? What behavioral principles would be useful in understanding this potential path dependency?

2.2 Coordination and governance of SSNs

One salient characteristic of service supply networks is that they arise from sets of bilateral agreements and ad-hoc solutions. Given the potential for catastrophic failures of such complex systems (see, for example, Verleye *et al*., 2017), inquiries into network coordination and governance constitute a promising avenue of research. Arguably, SSNs are often not the product of a single designer but emerge organically from the interactions of disparate agents in pursuit of their own individual goals. The lack of centralized network coordination in SSNs can result in local optimization leading to sub-optimal network performance. Conversely, the redundancy and flexibility of a loosely coordinated SSN could lead to a lower likelihood of major failures. Furthermore, depending on the nature of the network, different participants can take the role of network coordinators. For example, in health care services, family doctors or the patients themselves often take on the responsibility of assembling the network and transferring information among various specialists (McColl-Kennedy *et al.*, 2017). The operational performance outcomes of different coordination mechanisms (or lack thereof) constitutes a promising area of research that should include the applicability of techniques developed in

manufacturing settings (e.g. lean production principles) as the basis for the creation of a coordinated system in SSNs.

While existing research has shown that relational ties play an important role in service supply chain performance for direct suppliers (Field and Meile, 2008), there is still much work to do to understand the role of both relational and operational coordination practices on the overall SSN performance as well as on the performance of individual members. What are the emerging coordination practices for task and capacity allocation within the network? What coordination practices lead to better performance in different industries and different types of networks? How does the relative power of network participants influence the composition and functioning of the network? How does technology impact the answers to the preceding questions (i.e., how can technology best be used to help trace the network and coordinate the services)? For example, can readily available information about SSN providers and a history of interactions (e.g. emails, calls, contacts, calendar) be leveraged as a coordination mechanism? When should information aggregators (e.g. Google) act as central nodes in an SSN?

A valuable research opportunity in this context is offered by the legislative actions emerging as a reaction to new service delivery models. For example, rate parity clauses, whereby hotels are contractually obligated to offer their lowest prices to online travel agencies, have been outlawed in some countries. Similarly, some local governments are enacting regulations to limit or even stop the spread of sharing economy service models. Researchers can exploit these legislative differences as quasi-experiments to explore how legislative changes in contractual coordination mechanisms influence operational decisions and performance of the SSN participants.

2.3 Service failures in the SSN

Related but separate from the questions on coordination are the issues surrounding service supply network failures and their consequences. The effects of a SSN service failure can be unevenly distributed through the network and can disproportionately impact actors who were not responsible for the failure in the first place. Work by Fredendall *et al*. (2009) has shown that standardization of work practices across such a network can play an important role in mitigating the risk of partner failure. However, the establishment of SSN standards can be difficult when the network does not have a focal firm capable of imposing them, as often happens in complex networks (Harvey, 2016; Sampson *et al*., 2015; Shah *et al*., 2008). Thus, how can firms buffer themselves against the consequences of a SSN partner's failure? How can service firms assess their risk exposure arising from partners in their SSN?

Moreover, as the service supply network is often not visible in its entirety to the final customers, it is likely that customers will place the blame for the service failure on the SSN partner with which they have direct contact. It is not clear if different characteristics of the network, such as whether the SSN is assembled ad-hoc by the customer or is a stable arrangement, influence the customers' attributions of blame for a SSN service failure. Research on customer participation indicates that the effect of a service failure on customer dissatisfaction is larger when the customer had an important role in the service (Heidenreich *et al.*, 2015). Would a similar effect translate to dissatisfaction in customer-assembled service networks? Of particular interest is the study of possible mitigation strategies for network participants with respect to customer perceptions and opportunistic behaviors of less visible SSN participants.

3. Theme #2: Evaluating and Measuring Service Operations Performance

A general question that emerged from the Delphi study was, "who or what evaluates service operations performance?" The digitization of data from myriad sources and the increasing availability of this data are providing opportunities for researchers to address this question from new and different perspectives. In particular, the digital era has revolutionized how service firms can capture, analyze, and use data to improve operational efficiency, service quality and perception, customer behavior, and market sentiment, as well as foster service innovation (Manyika *et al*., 2011; Mayer-Schönberger and Cukier, 2013). Thus, the collection of data, analysis of data, and use of data are topics we examine within this theme.

3.1 Collection of data

The "Internet of Things" (IoT) or "smart" devices are becoming more and more prevalent in both consumer and commercial products (Zaslavsky *et al.*, 2012). Sensors on many of these IoT devices enable collection of users' behavior at an unprecedented level and drive innovation of service offerings (Hartmann *et al.*, 2014). Also, online data collection in the form of browser activity tracking, social media activity, mobile geo-location recording, and online product/service reviews provide service organizations with a broader perspective on their offerings and their operations.

Similar to how logistics of goods can be more easily tracked, advancement in the development and use of sensing, actuating, controlling, and tracking technology has increased the ability of service firms to explore the movements and behaviors of participants in a service system. For example, Disney amusement parks offer guests a wristband called the MagicBand

that uses RFID technology to track visitor activity. Guests are willing to be monitored because of the benefits that come with the band, including a cashless payment mechanism, a built-in lost-child tracker, room keys, and a reservation identifier for park entrance, resort room and FastPass ticketing (Kuang, 2015).

However, a relatively unexplored issue in this regard is the role that customers play in the data collection process and their willingness (or lack thereof) to accept different data collection technologies. Disney reimagined this seemingly privacy-invasive sensor into a fun, fashionable, and invisible part of the experience, which helps customers feel more comfortable wearing a device that collects data on their behavior in the amusement park (Kuang, 2015). Behavioral economics literature often explores individuals' willingness-to-pay or willingness-to-accept an outcome (Hanemann, 1991). Extrapolating from this, the idea of a customer's or client's willingness-to-be-tracked has ramifications about what types of data service firms can collect and what types of analysis these firms can do. What elements of a data collection system are more or less palatable to customers and clients? How are customers incentivized or persuaded to have their in-service actions recorded? Which types of data are more easily collected and at what point in a service operation is data best collected? Who should do the collection: service provider, client, or a third party? Finally, how does control and ownership of data impact operations?

3.2 Analysis of data

Data analytics and the use of "big data" have a dramatic effect on how services are designed and delivered, how experiences are created and perceived, and how the performance of operations are measured and evaluated. The trendy topics of big data and analytics have been

around in most business fields for several years now; see for example, big data treatises in supply chain management (Waller and Fawcett, 2013), production economics (Wamba *et al.*, 2015), MIS (Chen *et al.*, 2012), and general management (McAfee *et al.*, 2012). However, we see a gap in describing how large-scale data collection and analytics can impact the daily performance of service providers.

We first need a more thorough understanding of what type of analyses different service firms utilize to make sense of the influx of operational data. Big data analytic methods include statistics-based modeling, network analysis, text analysis, image analysis, sentiment analysis, machine learning, and computational aggregation (e.g. IBM's Watson). These methods often derive their results by using full population data instead of sampling techniques used in inferential statistics. The full population data is regularly "big" and analytic methodologies therefore require specialized understanding of data handling, storage, and visualization. The opportunities presented with service operations big data seem equally yoked to the challenges in making sense of the data and being able to use it to effectively improve operations.

One challenge presented with big data analytics is the seemingly complex and opaque nature of the analysis, which could potentially lead to a misinterpretation of the outcomes of the analysis. Some data scientists are pushing the public to question the big data algorithmic-based performance metrics of service workers, challenging the assumption that "mathematical analytics" is science-based and therefore "smart" (O'Neil, 2016). Take for example the measurement of elementary school teachers in populous U.S. cities; many districts now use the black-box Value Added Modeling, which has been shown to be a less-than-robust measure of teacher performance (Rubinstein, 2012). In addition, researchers in quantitative methods are

raising multiple questions about the use of big data algorithm-based decision-making tools that are used by service systems in areas such as policing, education, finance, and insurance (O'Neil, 2016). Therefore, transparency of analytic techniques will be required in the future as more and more service operations decision support systems rely on big data analytic techniques. We expect to continue to see research in transparency, reliability, and trust in analytic methods.

Equally important to the question of "how" a service is analyzed is the question of "who" is evaluating the service. In the era of social media, short news cycles, and citizen journalism, often times non-customers can have a strong influence on operational aspects of a service. The influx of self-recorded encounters and reviews uploaded in online spaces have led to entire political and protest movements against the operations of specific service systems. For example, multiple police departments have experienced public relations issues surrounding their officers' recorded responses to certain situations. As a result, a service's operations may change dramatically because they exist in increasingly data-rich contexts. How do service systems react, respond, and re-evaluate their operations in these environments?

3.3 Use of data

Of interest to service operations researchers and practitioners are not just the methods of analysis, but also the challenges in translating analytics into useful decision support systems, performance metrics, and service innovations. How service providers, and specifically frontline employees, can use big data analytics in service encounters is still in its infancy. Real-time and geospatial analytics, combined with the proliferation of mobile computing, have brought innovation into entirely new markets, as exemplified in the sharing economy. How will big data drive service design changes (e.g. Newman *et al.*, 2002)? How will customers react to data-

driven encounters? In what service industries and service settings do we expect to see more real-time operational changes based on data? How will big data and analytics change what it means to be a service provider (Medina-Borja, 2015)? How useful are data analytic predictive approaches like machine learning, which uses algorithms to interpret data and extract knowledge, compared to more human-centered approaches for operational design and management decision making? What impact do machine learning environments have on operational performance and efficiency as well as customer satisfaction and other effectiveness measures?

The topic of service automation (i.e., replacing human capabilities with technology) (Glushko and Nomorosa, 2013), fits within the discussion of data use. A call for a more human-centered focus on service system design (Maglio et al., 2015) implies that the information generated from analyses of service operations can lead to advancements in automation that mimic human-behavioral capabilities within a service system (Medina-Borja, 2015). Previous work in self-service technology has been invaluable in the service operations literature (e.g. Froehle and Roth, 2004), and new concepts of automation of service processes inside or outside the customer domain can drive efficiency, effectiveness, and customization (Sampson, 2012a). How can big data be used to contribute to service automation, including ways to increase its human centeredness? In which areas do we expect growth in data-driven automation?

Finally, using service data and the descriptive power of analytics provides opportunities to add transparency to transactional services. While researchers have investigated transparency as an operational construct (Buell *et al.*, 2016; Buell and Norton, 2011), data-

driven transparency within a service setting has many other interesting implications. The expectation for increased data-driven transparency is particularly relevant as service firms collect more and richer types of personalized data and allow individuals to see more thoroughly into the workings of a service system (Brown *et al.*, 2011).

4. Theme #3: Understanding Customer and Employee Behavior in Service Operations

A growing area of research in service operations has been the examination of the human side of designing and managing operations (Chase and Apte, 2007; Cook *et al.*, 2002; Dasu and Chase, 2010; Dasu and Chase, 2013). The first meaningful behavioral perspective for studying service operations was offered by Chase and Dasu (2001), who highlighted distinct interpretative approaches customers use to evaluate the sequencing, duration, and rationalization of service experiences. To inform this research, service operations researchers turned to insights from the human-focused behavioral sciences (e.g. psychology, sociology, cognitive science). Adapting Bendoly *et al*.'s (2015: p. ix) definition, we view the study of behavioral service operations management as the examination of the interaction of human behaviors of individuals or groups —be they the service employee or the customer—and the service system.

Despite the need to consider the behavior-influencing role of people on the efficiency and effectiveness of services, most service operations researchers opt to model employee roles and conduct according to the rationalizing simplification of human behavior such that workers operate predictably and deterministically (e.g. no occurrence of fatigue or learning); function independently; are not a major functioning factor or part of the offering; are emotionless; and are perfectly observable work effort-wise (Boudreau *et al*., 2003). Applying more realistic

human behavior characterizations to study service operations will likely increase research design and analysis complexity, which may explain why the study of service constitutes only a small percentage of published behavioral operations research (Croson *et al.*, 2013).

Research on the design and delivery of service would be enhanced by integrating insights not only from the behavioral sciences, but also from other business disciplines, especially organizational behavior, human resources management, and marketing. We highlight three promising areas for further study of behavioral service operations that would benefit from an interdisciplinary approach, namely managing the productivity and effectiveness of the service effort, designing customer service experiences, and affect-based service scheduling.

4.1 Managing productivity and effectiveness of the service effort

Service involves predominantly provider-driven, though frequently customer co-produced, efforts (i.e., work endeavors to fulfill customer demand). To maximize the productivity and effectiveness of employees involved in service delivery (Bowen, 2016) and customer participation in service encounters (Mustak *et al*., 2016), it is important that research account for employee and customer goals, interdependencies, and implicit heuristics, biases, and mental models. Insights from social and cognitive psychology can meaningfully inform service process design and policy development by factoring in potential human predispositions that can constrain the capability of service participants. A question for future study is how employee and customer goals and outcome expectations can be incorporated in, and aligned, to improve service design and delivery. For example, some new technologies (e.g. apps that help patients manage heath conditions) embed design elements to encourage alignment of actor behaviors

with desirable actions (e.g. a badge system) (Matheson, 2015). However, what impact do these new technologies have on alignment of behaviors with actions and do they actually help improve the productivity and effectiveness of the service effort?

Prior research has also been conducted on worker behavior as it relates to long-held assumptions regarding process flow management in a production setting. Most notably, researchers have shown that processing times are not necessarily independent or consistent. For example, workers tend to speed up when they are the cause of idle time for others (Schultz *et al*., 1998); workers tend to speed up when there is less work-in-process inventory (Doerr *et al.*, 1996); and workers tend to slow down when asked to share work in parallel production systems (Schultz *et al*., 2003). Powell and Schultz (2004) demonstrated that production line workers adjust their speed based on state-dependent behaviors such as other workers' speed, inventory buffer levels, and the length of process lines. Therefore, an important avenue for future research within services operations will be examining how service employee productivity and effectiveness is influenced by similar state-dependent elements. In particular, what are the state-dependent elements of a service system that influence employee and customer productivity? Perhaps more importantly, how does this type of research relate to the effectiveness of service outcomes? One example of the impact that work design has on service effectiveness is the emerging research on operational transparency, defined as the revelation of otherwise hidden work that goes on behind the scenes (Buell and Norton, 2011). Illustrating the relationship between operational transparency and effectiveness of the service effort, Buell *et al*. (2016) described a case in which service quality increased through more interaction

between customers and behind-the-scene service workers. Continued research that examines the effect of such work design elements on service performance outcomes is needed.

4.2 Designing customer experiences

It is imperative that service providers factor in the human element and account for variability in customer behavior and perceptions when designing customer experiences. A customer experience is an emergent, personal, and memorable "happening over time" (cf. Pine and Gilmore, 2011). Collectively, customer experiences are difficult to operationally manage because of their heterogeneity (Verhoef *et al*., 2009). Moreover, because "perception is reality," customer perceptions of their service experiences are most salient (Lipkin, 2016).

Early conceptual models of service quality offered by Zeithaml *et al.* (1996) and Haywood-Farmer (1988) explicitly incorporated behavioral considerations and insights, and research in service operations has begun to incorporate some of those considerations and insights when empirically examining experience management (Voss *et al.*, 2008) and the design of experience-centric services (Zomerdijk and Voss, 2010). However, more research is needed to understand how service design and delivery can inspire or manage behavior-influencers throughout the customer journey.

For example, how can service firms plan for, monitor in real time, and improve the emotions, sense of trust, and perceived control of customers? Additionally, how can service providers be more intentional in their process design choices to influence intended behavior and emotional responses of customers? How can service processes be designed in anticipation of customer emotional states such as in high anxiety service encounters like healthcare or financial services (Shell and Buell, 2017)? What forms of operational transparency most

effectively improve customer perceptions of trust? How can scripting techniques be used to positively influence trust? Does perceived control matter more or less to customers for different service process types? In a healthcare environment, what types of information and frequency of touchpoints for receiving such information enhance perceptions of control by patients and how do such efforts influence the patient experience? With the increase in technology-mediated services, how can these technologies and associated processes be designed to inspire trust and perceived customer control, while reducing customer anxiety?

4.3 Affect-based service scheduling

The concept of optimal scheduling and routing has been a longstanding topic in operations management. However, earlier work tended to ignore the human element, essentially replacing widgets and products with customers and servers, but did very little else to account for possible differences that a service might entail. Although early scheduling efforts led to improved queuing systems and scheduling and routing algorithms, it often failed to incorporate the realistic assumptions that make service delivery complex. Furthermore, these efforts only considered constraints or objectives that could be easily represented mathematically.

A new breed of service-scheduling literature has emerged that considers the behavioral affect-based contribution a schedule might make on customer experiences (Dixon and Victorino, 2017). "Affect" refers to the emotional or behavioral responses that a customer has during an experience (Dixon and Victorino, 2017). Thus, affect-based scheduling research investigates how service schedules can impact affective elements such as acclimation and memory decay (Das Gupta *et al*., 2016) and surprise and anticipation (Dixon *et al*., 2017). Researchers have provided empirical evidence that a customer's evaluation of service (Dixon *et*

al., 2017) and future purchasing behaviors (Dixon and Verma, 2013) can be influenced by affect-based scheduling efforts and that affect phenomena can be incorporated into large scale complex scheduling efforts (Dixon and Thompson, 2016; Dixon and Thompson, 2013). These models explicitly consider the success of the schedule in light of theoretic affect-inducing attributes (i.e., service designers should be able to leave customers with improved experiences by using behavioral principles). Considering the influence that affect-based scheduling plays in designing experiences, the research questions that these studies suggest are numerous. For example, what influences customer preconceived preferences of ideal service schedules? How does affect-based scheduling impact customer memory of experiences? More generally, what elements of the service system make affect-based scheduling possible?

5. Theme #4: Managing Servitization

Servitization is the "development of new business models" (Ostrom *et al.*, 2015: 134) for "adding customer-centered services … to product-centric business models" (Zeithaml *et al.*, 2014, p. xiv). It is an organizational transformation, with development of supporting structure and technologies for delivering services in replacement of or in addition to products. A servitized business model generally refers to a pay-per-use arrangement with customers, e.g. pay-per-mile for transportation, pay-per-minute for telecommunications, pay-per-print for photocopy equipment.

The growth of servitization coincides with a major global economic shift, from material-intensive manufacturing activities to information-intensive services (Karmarkar *et al.*, 2015). Such shifts can improve firm productivity and performance, although the benefits are

contextual in nature (Eggert *et al.*, 2014; Josephson *et al.*, 2016; Karmarkar *et al.*, 2015; Lay *et al.*, 2010; Neely, 2008). For example, servitizing firms with better financial performance have more decentralized decision-making processes, higher shares of loyal customers (Eggert *et al.*, 2014), broader service offerings, and more customized product offerings (Lay *et al.*, 2010). Similarly, lower stock risk (volatility) is observed for servitizing firms that have greater research and development intensity, service offerings more closely related to existing product offerings, lower marketing (spend) intensity, and less resource slack (Josephson *et al.*, 2016). Future research should determine the best performance measures for evaluating the success of servitization, as well as which supplier-customer structures (e.g. business-to-business (B2B), business-to-consumer (B2C), contract type) perform better with servitization (Zhang and Banerji, 2017).

Much of the servitization literature is fairly recent and still developing, with several research areas that warrant further exploration (Baines *et al*. 2017; Lightfoot *et al*., 2013). We focus on four topics within the servitization theme that have considerable potential for innovative research: rethinking product-centric business models, redesigning resource configurations and processes, enhancing sustainability through servitization, and creating contracts for changing customer attitudes.

5.1 Rethinking product-centric business models

Significant organizational design changes (e.g. to culture, human resources, organizational structure) are needed to move a firm from a product-centric business model to one which is either purely service-based or some combination of the two (Fisher *et al.*, 2010; Gebauer *et al.*, 2010b; Raddats and Burton, 2011). Firms may need to alter product designs when servitized

products include maintenance contracts or are purely leased to customers. For example, component accessibility may be improved to ease maintenance, and durability and ease of disassembly may be redesigned into products destined for re-rental and/or remanufacturing (Sundin *et al.*, 2009). Research is needed to determine which product design changes are most beneficial in this new service relationship, especially as they relate to efficient and effective service delivery.

While existing studies provide servitization guidance for certain industries (e.g. Martinez *et al*. (2017) study the pharmaceutical, engineering, and education industries), other industry contexts for servitization remain unexamined. For example, the intersection of servitization and the sharing economy offers a potentially fruitful space for exploration of service and business model innovation. How are servitization business models similar or different across these unexplored industry and business configuration contexts? Research in unstudied industries may help to provide a fuller picture of the opportunities and challenges of ongoing service-centric business models in product-based businesses. In addition, servitization does not need to be total, that is, a complete shift away from product-centricity to service-centricity. Continued exploration of hybrid business models that include both product and service offerings will allow better understanding of the realm of business model options.

5.2 Redesigning resource configurations and processes

Investments in resources and process development necessary for servitization can be significant. The transition to a service orientation tends to exhibit a predictable progression of increasingly intensive service activities beginning with the provision of basic customer service and moving to after-sales service, customer-support (maintenance), development partnership

(co-designing service processes and offerings), and finally outsourcing partnership (pure leasing of product coupled with provision of all training, repair and replacement services) (Gebauer *et al.*, 2010a; 2010b). What are the resource configurations, including capabilities, methods, and tools, that are important for the successful transition to a service-orientation at each stage?

Servitization is possible for most types of supply chain relationships. While early movers in sertivization have been mostly B2B, it is likely that B2C servitization will become more common (e.g. ZipCar) as communication and sensor technologies continue to improve. Thus, how (or should) resource configurations differ between B2B and B2C applications? In particular, what are the best technologies and user interfaces for B2B and B2C servitization?

5.3 Enhancing sustainability through servitization

Firms can use sustainability initiatives to drive innovation, and servitization is one way to shift business models and strategies toward sustainability for both operational and environmental benefits (Baines *et al*., 2009; Corbett and Klassen, 2006; McPhee, 2014; Parmigiani *et al*., 2011). Many products now have technology that monitors their use and provides both the customer and manufacturer information on characteristics such as usage and maintenance time, as well as feedback on potential problems or resource consumption, so that support services can be provided, as needed. Enhancing sustainability through servitization can be aligned with these and other supply chain design decisions (Parmigiani *et al.*, 2011), such as quality and inventory management decisions (Corbett and Klassen, 2006).

Research on specific servitization mechanisms shows there are opportunities to simultaneously benefit both consumers and the environment, for example by pooling customer needs to reduce the total production volume required to meet demand, or simultaneously

increasing product efficiency and functionality, e.g., developing electric vehicle batteries with greater travel range (Agrawal and Bellos, 2016; Naor *et al.*, 2015). Design of such mechanisms should be tied to user motivations and values, such as consumers' desire to feel that they protect the environment through their service purchase (Wunderlich *et al.*, 2012). What is the relationship between firm or customer environmental preferences and sustainability goals? How can these best be matched with servitized product and process designs? While issues of environmental impact and sustainability, as they relate to servitization, have been explored to some extent, further research on how servitization may contribute to, or even detract from, sustainability would be an interesting contribution.

5.4 Creating contracts for changing customer attitudes

Just as servitization significantly alters business practices among product-centric firms, these firms' customers – either consumers or businesses – must also undergo significant changes in their attitudes and behaviors and/or their own business models (Lim *et al.*, 2015; Wunderlich *et al.*, 2012). Performance-based contracting, based on product use rather than ownership, raises questions of which product and service attributes should be included in contracts, e.g. product operation, maintenance, financing (Hypko *et al.*, 2010a; 2010b). How can informal control mechanisms be combined with contracts to influence the behavior and relationship of the parties participating in the servitization model? Risk on both sides of the contract (supplier and user) must be considered, as the type of contract can significantly impact product design and manufacturing decisions, as well as related service design decisions (Guajardo *et al.*, 2012; Ng and Nudurupati, 2010).

Designing win-win contracts that increase value and/or decrease costs for both buyers and sellers should capture the attention of service operations researchers. In particular, research that examines the operational benefits and synergies that contribute to increased system-wide value through contracting in the servitization model would be of great value. Ultimately, servitization changes supply chain relationships. Both buyers and sellers experience shifting risks as they transition to new servitized business models. How should supply chain partners share these risks and who decides? What supply chain risk profiles are associated with better operational performance and how can this be codified in contract design? Deepened understanding of these risks and their consequences will enable the parties to improve decision-making and create the knowledge needed to fully inform these decisions.

6. Theme #5: Managing Knowledge-Based Service Contexts

Strong empirical evidence has suggested that the growth of knowledge-based services is the primary driver of the rise of the service economy (Peneder *et al.*, 2003). Although all service processes are to some extent dependent on knowledge inputs, the term "knowledge-based" usually describes services that are relatively intensive in their inputs of technology and/or human capital. Examples of such services include accounting, legal, medicine, consulting, and education services. To better understand and deliver knowledge-based services, researchers have investigated general topics such as typologies of professional services (von Nordenflycht, 2010; Lovelock, 1983), professional service firms (Blackler *et al.*, 1993; Hinings and Leblebici, 2003; Løwendahl, 2005; Løwendahl *et al.*, 2001; Mills *et al.*, 1983) and professional service operations management (Harvey *et al.*, 2016; Lewis and Brown, 2012), as well as more

specialized service contexts such as healthcare (Golden and Seidmann, 2012) and consulting (Roels *et al.*, 2010; Xue and Field, 2008).

Two key forces are shaping the future of knowledge-based services. First, technological innovations, such as self-service technologies and IoT devices, have revolutionized how services are delivered and experienced (Field, 2016). Second, a human-centered design approach (Buchanan, 2004) is increasingly informing innovations for better experience (Pine and Gilmore, 1998) and better management (Dunne and Martin, 2006). Against this backdrop, we present the following three research topics: innovations in health care for enhanced patient experiences, dynamic knowledge-based work, and complex knowledge-based service systems.

6.1 Innovations in healthcare for enhanced patient experiences

Research on innovative service processes that integrate expert knowledge and human-centered service design is needed to address immense social challenges such as population health management. Our society is increasingly aware that health management necessitates not only medical expertise to care for patients, but also a wide range of services that enhance access, focus on prevention, and deliver good healthcare experiences to the entire population, including previously under-served groups such as the uninsured and elderly (Carter-Pokras and Baquet, 2002; Fiscella *et al*., 2000). This holistic healthcare approach requires a deeper understanding of both clinical and experiential aspects under certain resource and policy constraints. Research that aims to quantify and monitor these two outcomes and understand the constraints can therefore inform both healthcare service providers and policy makers in designing a better service delivery system toward building an effective health management ecosystem. This research need leads to questions such as: How should the effectiveness of

emerging innovations, including electronic medical records, telemedicine, and self-health management solutions, be measured? How will different segments of the population interact with these innovations? What are the implications for cost, quality, and access?

6.2 Dynamic knowledge-based work

The nature of the work performed by knowledge-based service organizations is dynamic, as creative innovations develop into standardized processes. Traditional service classifications (Schmenner, 2004; 1986; von Nordenflycht, 2010;) have emphasized the creativity and autonomy aspect of knowledge-based work, while knowledge workers usually apply a combination of customization and routines to help their clients (Lawrence *et al.*, 2016). Knowledge-based business services have begun experimenting with technology-enhanced routinization to increase productivity (Sawhney, 2016) and reduce inconsistency in decision-making (Kahneman *et al.*, 2016). In the B2C realm, an excellent example of such experimentation is Massive Open Online Courses (MOOCs) where great teachers deliver standardized lectures to the masses for free (Pappano, 2012). For such experimentations to develop into true disruptors, however, rigorous research is needed to evaluate these experiments and provide guidance to industry. How should knowledge-based service organizations manage client co-production (Bettencourt *et al.*, 2002) as they adopt hybrid processes performed by both algorithm and human knowledge workers? What is the impact on productivity by utilizing algorithms to serve clients? What is the impact on the client experience and relationship building? Under what conditions do algorithms yield better performance than human interaction?

6.3 Complex knowledge-based service systems

Knowledge-based services are inherently multidisciplinary and require active participation from multiple stakeholders, resulting in complex service systems where the stakeholders interact and give rise to emergent properties (Spohrer and Maglio, 2008; Wagner *et al.*, 2014) . In other words, these complex systems are composed of many diverse and autonomous components that interact in a nonlinear, networked fashion, with the whole system evolving over time. The interactions at various boundaries, such as disciplinary, organizational, and industry, constitute interesting contexts for impactful research. The boundary between goods and services has already been blurred by servitization business models where manufacturers now provide value-added services using sensing technologies and data analytics (Neely, 2008). In addition, service system practices are crossing industry boundaries, such as when hospitals work with hospitality organizations like the Ritz-Carlton Leadership Center to improve employee engagement and patient satisfaction (Kaissi, 2012). Such boundary-crossing activities will further broaden and deepen as sensing technologies and advanced communication systems become ubiquitous (Atzori *et al.*, 2010; Gubbi *et al.*, 2013). For instance, health management services in the future are likely to be delivered via a service supplier network consisting of personal health management app developers, data analytics and cloud computing firms, healthcare providers and government agencies, among others. Meanwhile, each individual will be provided with rich and more up to date information about their health to assist their participation in the service delivery system. In these new service contexts, how will existing frameworks for service strategy and concept design apply to complex service supply networks? How should stakeholders measure, monitor and understand the interactions, emergent properties, and performance outcomes? Where does or should knowledge reside?

Driven by accelerating technological development and a human-centered design approach, knowledge-based services continuously evolve by innovating and standardizing at the same time. In addition, new services and new service systems emerge from the interactions among multiple stakeholders from various disciplines, organizations, and industries. Service management researchers can make a positive impact during this evolution by working on new conceptual frameworks, better measurement tools, and empirical verification.

7. Theme #6: Managing Participation Roles and Responsibilities in Service Operations

Over the past fifty years, the role of a customer in service operations has evolved from environmental disturbance (Thompson, 1967), to efficiency obstacle (Chase, 1978), to labor source (Bowen, 1986), to value co-creator (Ramaswamy, 2006; Wikström, 1996), to self-servant (Meuter *et al.*, 2000). Expanding the participation roles of customers in the service delivery process can facilitate better alignment between the operation's capabilities and its customers' needs and preferences (Lusch and Vargo, 2006), enhance customization (Kelley *et al.*, 1990; Xie *et al.*, 2008), and reduce labor costs (Bowen and Jones, 1986). However, expanding participation roles can also lead to input uncertainty (Larsson and Bowen, 1989), higher employee workload and stress (Hsieh *et al.*, 2004; Hsieh and Yen, 2005), and unfavorable attributions for service outcomes (Bendapudi and Leone, 2003). As such, the question of how to best manage customer participation roles and responsibilities in various service contexts remains an important avenue for scholarship.

In many respects, the dynamics driving contemporary research on this topic are the same ones that have driven the topic for decades: customers' service expectations are rising,

managers' cost reduction targets are intensifying, and technologies that promise to reconcile these competing objectives are evolving. However, the service delivery landscape has changed materially in recent years, as customers have grown more autonomous, data has increased in ubiquity and utility, and the ways in which customers interact with service organizations has diversified. These changes necessitate the consideration of a broader and more nuanced set of questions around the implications of allocating more work to customers, how customer and employee resources can be most productively integrated, and how to optimally design and manage omni-channel interactions with a singular and consistent relationship.

7.1 Allocating more work to customers

One way to reduce costs and increase customization is to allocate more work to the customer. Although a service customer is always a co-creator of value, their involvement in the actual production process (co-production) is highly variable (Vargo and Lusch, 2008), with the optimal degree of co-production increasing in the level of customization required (Roels, 2014). A well-developed stream of research has explored the perceptual drivers of customer trial, adoption, and persistence in the use of self-service technologies (SSTs) (Collier and Sherrell, 2010; Hilton *et al.*, 2011; Meuter *et al.*, 2005; van Birgelen *et al.*, 2006; Wang *et al.*, 2012). As technology has advanced and the customer's role in co-production has become more sophisticated, technology readiness, as well as task-specific self-confidence and self-efficacy, remain critical drivers of adoption and acceptance (Lin and Chang, 2011; Parasuraman, 2000; van Beuningen *et al.*, 2008). This underscores the value of educating customers (Retana *et al.*, 2016) and designing experiences that reward consumers with a value gain commensurate with their co-production role (Hilton *et al.*, 2011). However, as service processes increasingly incorporate smart

technologies, how does this process change impact the technology readiness requirement of these service encounters and the role of the customer?

Even when the customer takes on a greater share of the service delivery work, it is unclear that performance will improve over the long term. Higher retention rates among self-service customers have been attributed to switching costs, rather than improvements in satisfaction (Buell *et al.*, 2010). Moreover, increasing self-service can reduce profitability by increasing overall transaction volume and changing the mix of service channels, such that overall costs increase (Bavafa *et al.*, 2017; Campbell and Frei, 2010). Consequently, we believe that a fruitful area of research is to investigate how increased reliance on self-service technologies impacts long-term relationships between the customer and provider. One piece of the puzzle is how to manage customer perceptions and attributions in contexts where they are conducting an increasing share of the work. What are the dynamics that affect how customers apportion credit for service delivery? How can self-service interactions be designed to reinforce the firm's role in value creation and to simultaneously engender delight and participation? In addition, operational transparency can improve customer perceptions of the value created by the firm, even in self-service settings (Buell and Norton, 2011). However, research has yet to link these short-term perceptual enhancements to longer-term differences in performance outcomes.

Another customer work allocation dynamic worthy of investigation is how employees can be best leveraged in contexts where customers are taking on a greater role in service production. Can employee engagement, autonomy, creativity, and productivity be engendered when the employee plays a limited role, if any, in the transaction? Which facets of the service

relationship cannot be outsourced to the customer? These dynamics remain largely unexplored in service operations research, but as the transactional facets of service provision become increasingly automated, identifying ways for employees to remain engaged in the service delivery relationship will be critical.

7.2 Integration of customer and employee resources for value creation

Customer presence in the service process can enhance employee effort and persistence by influencing employee perceptions that their own work is appreciated and meaningful (Buell *et al.*, 2016b; Grant, 2007; Grant *et al.*, 2007). Moreover, by virtue of the customer's participation, they have the capacity to provide inputs, both tangible and intangible, to enhance the efficiency and quality of service performance. But fully capitalizing on this potential requires a reexamination of service process design, to effectively incorporate both individual and joint efforts among customers and employees.

Customer and employee objectives need to be aligned, and their efforts need to be mutually reinforcing in order to achieve peak service performance (Gremler and Gwinner, 2000; Hartline and Ferrell, 1996). Failure to properly diagnose the source of misalignment can lead to counterproductive prescriptions that undermine efficiency and quality, while alienating customers. How can researchers improve the diagnostic accuracy of the types of variability that customers are imposing and identify non-aversive ways to influence their behavior? Moreover, how can customer compatibility with the operation be proactively managed, either to select customers whose objectives and efforts are well-aligned with the design of the operation, or to identify low-cost ways to customize service delivery to move the operation closer to their heterogeneous needs (Buell *et al.*, 2016a)?

An additional opportunity for future research pertains to the effective management of intangible resources that customers and employees contribute to service transactions. In particular, customers, by virtue of their perspective, typically possess unique information about their own service preferences, and employees, by virtue of their experiences, typically possess unique information about the service process. Both types of information must be integrated in order to achieve service outcomes that conform to customer and organizational objectives, but unlocking this information presents challenges. Through their interactions, customers and employees reveal this information, both actively and passively. Rapidly evolving technologies afford the ability to collect and analyze these data in real time. However, customers value their privacy (John, 2015), reducing their willingness to share. In face-to-face contexts, concerns about social frictions like being misunderstood, judged, or perceived as unsophisticated, can make customers self-conscious and unwilling to reveal their true preferences (Goldfarb *et al.*, 2015). Even in technology-mediated settings, privacy-minded customers may take steps to obscure their preferences, rendering the data they generate to be non-informative (Cummings *et al.*, 2016). Thus, when integrating resources, how can companies engender trust and empower customers, as well as employees, to reveal private information?

7.3 Omni-channel participation roles and responsibilities

Advances in technology have afforded a proliferation of channels through which service is now delivered (e.g. face-to-face, phone, online, mobile), allowing many more touchpoints with the customer. Omni-channel strategies, which involve the combination of features of multiple channels during the customer journey, can improve convenience and access to information, goods, and services (Bell *et al.*, 2014), boosting customer satisfaction, loyalty, and sales (Bell *et*

al., 2017; Wallace *et al.*, 2004). However, increasing the number of channels and modalities through which service is delivered can alter the dynamics of how customers choose to engage with firms (Gallino and Moreno, 2014; Gallino *et al.,* 2017; Gao and Su, 2016), and can introduce complexities that hinder the consistency of the service they experience.

Although established streams of research examine how to optimize service delivery in particular channels (Field *et al.*, 2004; Heim and Field, 2007), we foresee a significant opportunity for future research to explore the customer and employee interdependencies presented by a broad omni-channel strategy, in which the participation roles and responsibilities for both sides are shaped by the dynamics of multiple channels. For example, how do employee and customer roles change by channel, and how should role transitions among channels be managed? In an omni-channel relationship, how might overall perceptions, such as perceived value, perceived quality, trust, and satisfaction be enhanced? Do some channels and interactions drive customer perceptions and evaluations more than others? For example, how might the sequence of the interaction, the valence of the interaction, the proximity of the interaction to a purchase, and the actor delivering service (human vs. technology) shape short-term perceptions and long-term attitudes? How can information most effectively be exchanged among employees who interact with the customer in different ways, so that a consistent picture of the customer's needs and preferences can be assembled? How can the differences in customer interaction modes among channels be reconciled so that the customer experience can be one that is both predictable and flexible?

8. Theme #7: Addressing Society's Challenges through Service Operations

Like all businesses, services have the ability to reduce harm to society or actively help solve social and environmental problems. Sustainable services (SS) are those entities that are not only financially viable but also consider the social and environmental dimensions of performance, working to mitigate harmful effects of their economic activities. Social impact services (SIS), on the other hand, pursue a social mission with the goal of "doing good" or solving a social problem such as poverty, hunger, and inadequate healthcare and education. In these organizations, profits are not the goal but rather support the social objective. Some SIS are non-profits that struggle with economic sustainability due to reliance on grants and donations while others are social enterprises, engaging in market activities to support a social mission. Both SS and SIS offer rich research opportunities for improving sustainability and social impact through service operations. In this section, we focus on these two types of services, and the metrics and frameworks associated with them.

8.1 Sustainable services

Over the last decade, the operations management field has seen an increasing amount of research on sustainability, particularly on environmental or green issues. Social issues, on the other hand, have not garnered the same level of attention (Carter and Rogers, 2008; Moxham and Kauppi, 2014; Zorzini *et al.*, 2015). To date, research on sustainable services has primarily focused on three industries: hospitality (Chun and Giebelhausen, 2012; Kassinis and Soterious, 2003; Zhang *et al*., 2012), financial services (Weber, 2005), and tourism (Butler, 1999; Byrd, 2007; Clarke, 1997). While hospitality and financial services research has emphasized the environmental side, tourism research has typically gone further to cover tourism's social disruption effects on developing economies, communities, and ecosystems. Many more

opportunities exist to study different service sectors' trade-offs between profits, environmental performance, and social issues.

One of the challenges for improving the environmental aspects of many services is that customers play a significant role in how resources are utilized. If the service provider cuts back on water use or energy consumption, customers may not appreciate the results. Hence we see, for example, cards in hotel rooms asking the customer to voluntarily reuse towels and bedding to reduce resource use. Additionally, luxury service providers tend to worry more about customer experience than resource consumption and, thus, are challenged to improve sustainability performance.

Behavioral economics (Kahneman, 2003) offers the potential for nudging both customers and employees in a more sustainable direction. For example, an in-depth case study of Google's food service illustrated the role a powerful organization has in employing behavioral economics and other incentives to shape customers, employees and suppliers behaviors related to wasted food throughout the food service supply chain (Pullman and Rainey, 2016). The resulting behavioral changes improved environmental performance. However, more research is needed to see if these behavioral approaches can be extended further in different service sectors to achieve large scale sustainability improvements.

Sustainable services also include considerations about the conditions of employees. Yet, many services have poor reputations for their lack of concern with the well-being of their employees. Therefore, it is imperative that researchers examine how operational design choices contribute to improved or degraded employee well-being. Additionally, how can operations be designed with a more humane approach to the well-being of workers? For

example, Zappos' call center leverages the service profit chain by creating positive working conditions. What are the operational challenges that prevent other firms' service operations from doing the same? What are possible solutions to these operational challenges?

Lastly, in production-based supply networks, the traceability and authenticity of sustainable products typically relies on various certification and labeling schemes to signal sustainability attributes to consumers and buyers. Not only are certification schemes scarce in the service world, but research has been limited to eco-certification for hotels (and tourism locations). What are other industry applications for social and eco-certification and how does certification impact environmental, social, and operational performance? Could new types of certifications help achieve even greater social and environmental improvements?

8.2 Social impact services

Social impact services range from non-profit social mission services to social enterprises (i.e., social goals enabled by market activities) and even to for-profits with a social mission division. Ostrom *et al.* (2015) recognized a void in the social impact area and suggested "transformative services," i.e., services that affect social well-being, as a research priority. Accordingly, there is a need for service operations research that explores how to improve well-being through the design and delivery of social impact services. In addition, we see key opportunities to use a service operations lens for examining services as a driver for social change, designing or investigating service innovation at the bottom of the pyramid or for vulnerable customers, and other areas that create social impact at the individual, community, and national levels.

On the non-profit side, non-governmental organizations and government services play an important role in addressing complex problems occurring around the globe via delivery of

complex social services. With increasing frequency of natural and conflict-generated disasters or epidemics, government services and humanitarian organizations are called upon to respond, rescue, and rebuild damaged areas and lives. What is required for these "hero-services" to deliver more efficient and effective service responses to these crises? Exploring the coordination of various groups and mechanisms for sharing information during service delivery is one possible research avenue, as well as the pre-disaster structures, education or training, and preparation. In many of these social service organizations (e.g. Ronald McDonald House, Doctors Without Borders, Red Cross), staffing consists of volunteers and other roles beyond just paid employees. How should service processes be designed to effectively manage these diverse roles and share knowledge? How do efficiency, utilization, capacity, and other process measures change when work has intrinsic motivation as well as social goals?

Similarly, other public services face complex operational challenges. For example, failure in some can have dire consequences (e.g. counter-terrorism, police work) and result in significant public backlash. Thus, researchers should learn more about public service delivery challenges from researchers and practitioners in public administration and social services. In turn, service operations researchers can help public service providers to address such challenges through better process design and management. Related questions include: How can we incorporate behavioral operations insights to better design and deliver public services? How can service processes be designed to be more robust, given public service environments often have little tolerance for failure? How can operational transparency be improved to help engender public trust? What incentive mechanisms (e.g. extrinsic or intrinsic) are most effective for optimizing operational performance?

8.3 Frameworks and metrics for sustainable services and social impact services

Frameworks like the service profit chain (Heskett *et al.*, 1994; Heskett *et al.*, 1997) emphasize employees and their impact on performance, but we need new theories and frameworks that include more social stakeholders, such as the communities where organizations operate, as well as other partner organizations. As many of the social services, social enterprises, and other social mission organizations have received limited attention in service operations research, there are opportunities to validate the service profit chain in the context of social service organizations and develop other models that might fit these different types of services.

In these contexts, stakeholders are concerned with measuring both economic and social impact. Performance accounting is key to demonstrating the social impact and provides legitimacy. For example, Costa and Pesci (2016) posited a stakeholder-based approach for selection of social impact measures. Instead of a one-size fits-all metric to determine an organization's real impact, they proposed a more inclusive view where multiple stakeholders set performance standards based on their viewpoints regarding the measurement's purposes. This approach discourages organizations from opportunistically selecting a social impact measurement with the purpose of proving a higher impact. Thus, what types of metrics best measure social impact and other social sustainability concerns and how do these metrics depend on the SS or SIS? Where might we see significant trade-offs or win-win situations with different stakeholder's perceptions of impact? Should certain stakeholder's metrics be given more priority over others and why? Overall, research that evaluates both economic and social performance from different stakeholder perspectives would greatly contribute to society.

9. Theme #8: Operational Implications of the Sharing Economy

"Sharing economy" services represent much more than dynamic, real-time buyer and seller matching; they also enable enhanced forms of value creation (McAfee and Brynjolfsson, 2017; Sundararajan, 2016). In sharing economy services, customers have ubiquitous access to a vast array of intangible and tangible resources and services that are typically delivered by peers. Characteristically, throughout the production process — from inception to distribution to consumption — peers are active *co-producers* of goods and services. If the sharing economy is, indeed, a paradigm shift in service business model and delivery system structure, it warrants new service operations strategies that go beyond the introduction of e-service apps and e-marketplaces by old guard service incumbents. This paradigm shift applies to new entrants, such as Airbnb, Uber, and Citi Bike, where peers can share idle capacity, or Quirky, TaskRabbit, and Skillshare, where peers share their talents.

We recognize at the outset that sharing economy services are new intermediaries positioned within a service supply chain. Despite incumbents' hubris, their total impact on traditional service businesses is yet unknown; and it remains unclear whether all sharing economies are particularly revolutionary, efficient, or positive for society in the long term. For example Malhotra and Van Alstyne (2014, p. 25) state, "Micro-sourcing that pays for only the task at hand can shed overhead but mortgage the future by covering only marginal costs and leaving nothing for new skills, health care, or retirement." Firms like Uber, for example, may be taking an excessive share of system-wide profits. At the same time, Uber's drivers as non-employees, may not receive the same benefits or training as full-time cab drivers, and customers cannot be assured of proper driver vetting or a reliable car. Uber's widely publicized

human resource-based problems are merely the tip of the iceberg with respect to its immature management structures as manifest in many sharing economy firms, even as they are evolving operationally.

Facilitating the rise of sharing economy services is the synthesis of a number of breakthrough and maturing technologies — "super" user-friendly mobile devices, cloud-based services, supercomputing, crowdsourcing, advanced analytics, mature artificial intelligence, "Big Data", GPS location, real-time distributed processing, etc. An unprecedented number of digital sharing economy start-ups have appeared, enabling people to directly and dynamically access and network with and among peers virtually any time and anywhere (Evans and Schmalensee, 2016; McAfee and Brynjolfsson, 2017; Susskind and Susskind, 2015). Early U.S. matchmaker start-ups include eBay in 1995 (formerly AuctionWeb), which introduced peer-to-peer (P2P) and B2C online auctions and e-commerce, and Twitter in 2006, which provides instant news sharing, communication, and social networking.

Today unprecedented integration of advanced technologies permit the expansion of the sharing economy, creating an avalanche of decentralized, low-cost, niche P2P e-marketplaces (Zervas *et al*., 2017), many of which have been highly disruptive. The sheer volume of sharing economy service start-ups and their rate of morphing into new digitally based firms has taken some of their most entrenched industry competitors by surprise. They often shatter prevailing service sector wisdom of the customer experiences, management structure, and delivery system costs. In light of how nascent service operations research is on the sharing economy, we next consider how the basics of service delivery systems differ systematically from conventional services; and we offer research questions needing answers. Specifically, we consider three ways

in which sharing economy services are distinctive: duality of customer-peer co-production, value creation with asset-light operations, and deep customization and tailoring of service offerings for heterogeneous market (operating) segments. We conclude the section with a conceptual typology and examples relating sharing economy platforms to three salient dimensions.

9.1 Duality of customer co-production

In many sharing economy services, customers act as *both* service providers (peers) and receivers (traditional view of customers), creating what we call the *duality of customer co-production* at both ends of the delivery system. The role of the "customer as provider" in sharing economy services is unlike most traditional counterparts where co-production usually occurs between employees and customers. Zipcar is an exception (Frei 2006). With Uber, instead of calling a regular taxi, a customer logs into the app, enters a destination, and gets into and departs from the vehicle with the payment handled automatically. Consequently, the sharing economy business model often breaks down the need for the proverbial management hierarchies and human resources policies that are inherent in traditional service delivery systems with service employees (Heskett *et al.*, 1990). Nonetheless, there appears to be a growing need for more traditional back-office support, as illustrated by problems at Uber and new opportunities to enter upscale markets at Airbnb. Thus, while some sharing economy services retain their own employees to manage platform activities, they typically do not hire, train, maintain, and reward a cadre of their own internal customer contact employees, nor do they need to rely on traditional operations strategies to manage service capacity (e.g. control supply and alter demand) (Heskett et al., 1990; Sasser, 1976) or address customer-induced

variability (Frei, 2006, Secchi and Roth, 2018). However, research is required on better understanding these differences.

Nonetheless, most sharing economy service providers still need to address issues associated with the heterogeneity of customers as co-producers taking on roles of both service providers and receivers. One illustrative aspect of this appears to be a heightened level of customer fraud and deceit that erodes trust. Sharing economy firms today use rating systems, customer reviews, and other tools to help detect and prevent dishonesty, but what operational practices (e.g. poka-yoke devices) can help mitigate the effects of inevitable customer fraud incidents? Similarly, customers (peers) acting as service providers can also engage in fraud and deceit. While external organizations exist to monitor these activities, it is unclear if less-savvy end customers have the knowledge to access them. Along these lines, the following are important unresolved questions: First, what aspects of customer heterogeneity related to the duality of customer co-production are particularly impactful to operations – either positively or negatively? Further, how does the impact of customer heterogeneity differ in sharing economy businesses when contrasted to its comparable effects on operational performance in more traditional employee-customer co-production environments? Arguably, in the latter instance, the firm has more control over employees' behaviors.

To address these operational concerns, some sharing economy services are actively striving to cultivate and strengthen capabilities to accommodate the added system heterogeneity due to the duality of both "customer as provider" and "customer as receiver." Take for example, Facebook's courseware initiative, which provides advertising agencies courseware for trading and support, and EBay's buyer and seller discussion boards, selling

coaches and classes, knowledge base, and group support offerings. Beyond simply training customers for their dual roles, how should operational processes themselves be designed and managed when customers play a front-line role without direct employee intervention? How can the literature on employee and customer behavior (e.g. Heskett *et al.,* 1997) be combined to guide the choice of operational processes that account for this duality? For example, what are the means for each party in the service chain to "trust but verify" every other party?

9.2 Value creation with asset-light operations

The sharing economy changes the operational playbook by using a different set of economic rules (Libert *et al.*, 2016) for managing supply, including some firms that openly violate (or blatantly ignore) local laws and regulations (e.g. Uber). In terms of assets, many traditional corporations, even lean/Six Sigma stalwarts such as General Electric, rule by "more is better." Traditionally asset-heavy organizations, moreover, are frequently viewed as powerful and successful, often ranking among the most admired businesses. In stark contrast, sharing economy services are relatively asset-light and even gain competitive advantage by not "owning" significant tangible assets and/or by using *customers as providers'* excess capacity (Revesencio, 2015). As a result, they have substantially lower operating costs, increased flexibility, and the ability to rapidly enter a marketplace and scale up fast. In a worst-case scenario, they have the ability to exit the business quickly and even morph into a new business.

The competitive capabilities of such asset lightness are made possible by deploying independent and temporary workers, having little or no inventory and production costs, not owning a brick and mortar facilities network, and managing quality through external self-monitoring and customer feedback and review systems. With few tangible assets, and arguably

low barriers to entry, how sustainable are existing sharing economy firms' competitive advantages? How, and to what extent, do the operations of these asset-light firms contribute to their growth and sustainability? Does it differ from more asset-heavy firms? What existing models of service operations strategy are applicable to the asset-light sharing economy context? Or must entirely new theories and models better account for their idiosyncratic characteristics?

9.3 Deep customization of the service offering for heterogeneous market (operating) segments

On the demand side, sharing economy firms can efficiently close competitive market gaps. Many are delivering to particular niche and fine-grained customer segments, where some elements of the desired "service offering bundle" (Roth and Menor, 2003; Voss *et al.*, 2008) are otherwise being unmet by traditional and/or other sharing economy services. With ride-sharing services, for example, firms such as Uber and Lyft take the lion's share of ride-sharers. Yet, safety remains an unmet need for women and children, who comprise a more refined operating segment within the ridesharing market. Boston start-up Safr aims to fill this vacuum with fully vetted female drivers (Manning, 2016), while HopSkipDrive also uses highly vetted drivers and includes children-focused amenities like car seats (Zimmerman, 2016). Another sharing economy service that caters to specialized needs is Venmo's virtual, mobile wallet. Here, customers have the convenience of not carrying around cash along with the abilities to lend money to friends and simultaneously post comments on their transactions with everyone in their social sphere.

Viewing these sharing economy examples through an operations strategy lens, we can link elements of their respective service offering bundles with target customer segments.

While Safr and HopSkipDrive's explicit services (ridesharing) are similar to Uber and Lyft, their implicit benefits — increased levels of "perceived safety" for females and children, respectively — fill an unmet need. Venmo, like its more "vanilla" online financial service competitors, explicitly offers cashless payment and convenience. For millennials, however, sharing economy, experiential services, such as Venmo, are distinguished by emotional and psychological benefits from a social community that go beyond the financial payment.

In sum, these examples demonstrate that traditional service concepts (Roth and van der Velde, 1991), along with Roth and Menor's (2003) description of a "target market" and Frei *et al.*'s (2012) logic of "operating segments", can be extended to the virtual sharing economy by dissecting their service offerings into their elemental parts. In this way, they can apply deep customization. Thus, we first classify the "explicit service" and overall service priorities (e.g. the ridesharing segment prioritizes convenience and price) as "attractants" to a sharing economy service. Customers then match more refined elements of the service offering bundle - implicit benefits, experiential benefits, facilitating goods and services, platform information content, communication/socialization, and so forth - to their own particular needs and wants. These granular service bundle elements create what Roth and van der Velde (1991) term as "golden handcuffs," wherein target segment customers are willingly captive to the service provider. However, to deliver the full service offering consistently to heterogeneous service providers and customers in the sharing economy, a number of questions remain unanswered. What set of fine-tuned service operations strategy choices and requisite capabilities (Menor and Roth, 2003; Voss *et al*., 2008) are needed to fulfill the finely detailed needs of a granular market segment? How can technological advancements, including virtual reality, artificial intelligence,

avatars, and bots, affect the design and delivery of sharing economy services targeted to progressively smaller operating segments? Additionally, how will service offering portfolios be managed to meet heterogeneous customer needs as traditional service providers enter the sharing economy space (e.g. PayPal now owns Venmo, while big banks and other emerging financial services (e.g. Google Wallet) tout digital currency offerings). Vice versa, how will sharing economy firms move into traditional services (e.g. Airbnb goes upscale and contracts/outsources service providers to implement their specialty new services to upscale homes)?

9.4 Sharing economy conceptual typology

As a topic that has received little attention in the service operations literature (cf. 0% of the operations management articles in *JOSM* from 1990-2016), we extend the scope of this section by offering a "tentative" conceptual typology based on reviews of hundreds of printed materials (e.g. newspapers, magazines, research papers, sharing economy books) and an examination of hundreds of platform websites. We made a first attempt to digest this material and summarize sharing economy services' strategic operational characteristics in order to fill a large void in the service operations literature; i.e., a lack of a basic classification scheme as a starting point. We hope this will help service operations researchers advance new knowledge in this emerging area.

Our literature review found the term "sharing economy," while widely recognized, is yet ill-defined. A litany of terms — collaborative economy, gig economy, matching economy, peer economy, empowering economy, on-demand economy, 1099 economy, locust economy, among others — often are used interchangeably (Botsman, 2015). Such imprecise terminology

is common as new paradigms emerge in a field. The variety of terminology pertaining to sharing economy suggests there are nuanced differences among them. Therefore, these nuances ultimately offers opportunities to develop new frameworks, conceptual typologies, and numerical taxonomies upon which researchers can build a new knowledge base and deepen the theoretical precision of our understanding, in this case, of operational issues. (See, for example, the value of frameworks, conceptual typologies, and numerical taxonomies in jumpstarting traditional services, e.g. Lee *et al*., 2015 and Verma and Boyer, 2000.)

Today's technology-mediated sharing economy platforms enable shared service offerings between customers as service providers and receivers - most of whom are neither employees nor customers of the platform firm. We offer this conceptual typology as a first attempt to lay the groundwork, in part, for addressing high level strategic operational issues by using this type of multidimensional structure. As depicted in Figure 1, we find three salient dimensions of the sharing economy: 1) primary sharing function types, 2) generic transaction types, and 3) noneconomic versus economic incentive mechanisms. To inspire future sharing economy services and seed our understanding of related operational implications, we conclude with initial insights for classification. Appendix A presents illustrative sharing economy platforms that correspond to each of these categories.

The first dimension highlights four primary sharing *function types*: 1) share content, 2) use excess capacity temporally, 3) transfer ownership of tangible value, and 4) create intangible value. Notably, *one or more of these types can be combined* to create a sharing economy service platform. The number and types of sharing functions, as well as the relative mix of optional elements within each function deployed, determine the "richness" of a platform's

functionality. Importantly, richness shapes the sharing economy firm's service offering bundle, cost structure, ease of access, and target market reach. We posit that higher richness adds to operational complexity but also affords the firm to compete successfully in more granular market segments. It also shapes the technological underpinnings of the service offering.

The second dimension classifies nine generic *transaction types* associated with sharing economy platforms: 1) giving, 2) volunteering, 3) swapping, 4) sharing/collaborating, 5) talent/learning, 6) entertaining, 7) financial services, 8) renting, and 9) retailing. These types were, in part, derived from Botsman (2015), a list of 38 terms used by Matofska (2016) to describe sharing economy exchange activities, and extensive reviews of the literature and popular press. Importantly, Dimension 2 describes the basic transactional nature of the "explicit service" offered (e.g. ride "sharing" and virtual monetary exchanges).

The third dimension considers the *noneconomic and economic mechanisms* associated with the sharing economy firm; it considers whether the sharing economy firm is a not-for-profit (e.g. government, non-governmental organization) or for-profit commercial service. Bifurcation of these two groups helps us screen for the most important types of incentive mechanisms for motivating both customers as service providers and receivers to participate in the sharing economy platform activities. These underlying mechanisms are critical because sharing economy firms must have sufficient scale of both providers and receivers, and factors that affect willingness to participate are essential. We posit that people would be more inclined to participate in not-for-profit sharing economy platforms to the extent that they receive a threshold level of "intrinsic value" from doing so. With for-profit services, by contrast, we project more rationally-oriented, "utility value" that entice customer participation behaviors

would prevail. We posit that a successful sharing economy service must acquire a requisite level of customer intrinsic value and utility value based on the motivational mechanisms at play, which create sufficient value - intrinsic and/or extrinsic perceived value (extrinsic utility) of the experience (Hoffman, 2015; Lee *et al*., 2015).

The three dimensions in Figure 1 connote that sharing economy firms deliver services and create value in many ways that can be quite different (or the same) as their traditional counterparts; and they are highly interdependent with the three elements of the target market: 1) size (scalability), 2) specific requirements (complexity of service offerings) and 3) perceived value (willingness to pay). This assertion is predicated on the many combinations of options that are found between and within each dimension, adding to the complexity of the offering mix and its strategic fit with the granularity of a particular market segment. An abundance of future research opportunities exist in working to better understand the operational implications of sharing economy services across various combinations of the function types, transaction types, and incentive mechanisms in our typology. More broadly, we believe sharing economy services are a clarion call for researchers to advance new ideas and propose new theories in service operations. It is our expressed hope that this section offers a glimpse into the sharing economy using a service operations view, and will set the stage for answering questions to move theory and practice forward.

Insert Figure 1 about here

10. Discussion and Conclusions

In this article we offer numerous research questions to spur novel conceptual and empirical research in service operations. From the eight research themes identified by the *JOSM* Service Operations Expert Research Panel through our Delphi study, we chose to focus on selected topics within the themes where we perceived significant opportunities for exciting and innovative work. Of course, many other topics and research questions fall under the service operations domain that is not covered here. Thus, we encourage researchers to not only tackle the questions we proposed but also build on the ideas in this article to identify other stimulating topics and questions to address.

To help clarify the contribution of this article, we next provide summary questions by theme and topic that represent a synopsis of the individual questions and can serve as a quick reference guide. We then present examples of issues that transcend multiple themes, and therefore, have a broader potential impact on the service operations field. Additionally, the role of technology in service operations impacts every theme and thus merits a separate discussion. Finally, we conclude with some thoughts on what's next in service operations.

10.1 Summary of research questions by theme and topic

Throughout this article, we offered dozens of research questions intended to prompt leading-edge thinking and efforts in service operations research. Table 1 organizes these individual questions into a set of one or two summary questions for each topic within a theme. Recognizing that the number of potential research questions is virtually unlimited, the intention of this table is to give researchers an overall sense of the individual questions posed in this

article, while at the same time, providing a framework to facilitate the formulation of additional questions.

Insert Table 1 about here

10.2 Issues that overlap themes

In addition to promoting research on the aforementioned themes, we also see significant opportunities for studying issues that are at the interface of these themes, some of which have been identified in this article. For example, an interesting research area that overlaps the servitization and society's challenges themes is the alignment of firm and customer environmental goals when designing servitized product and processes. Servitization also overlaps with other themes such as service supply networks. Areas for study include understanding and managing the service supply network risks in a servitized business model and investigating other issues related to contract design.

Similarly, the theme of understanding customer and employee behavior intersects with other themes. For example, behavioral issues have overlaps with the theme of managing participation roles, which present a number of avenues for research, such as how customer behavior can be influenced to support effective co-production. Or on the employee side, how can behavioral insights can be leveraged to keep employees engaged in their roles when customer co-production is high? There is also much research potential in understanding customer and employee behavior in knowledge-based service contexts such as the role of emotions, trust, and control in healthcare settings. The duality of customer co-production in sharing economy operations takes the overlap one step further, requiring a fully integrated perspective on employee and customer behavioral research.

Although some overlaps are more obvious than others, the same type of assessment could be done for each of the themes. Moreover, it is possible that more than two themes may intersect around the same issue. We encourage others to identify and study overlapping issues as we believe these intersections offer especially fertile ground for future research and will help to enrich our understanding of how to manage modern service operations.

10.3 The overarching role of technology across themes

Advanced technology has had and will continue to have a profound impact on every one of the themes in this article. In each of the themes, we touch on how process design and, in the case of servitization, product design helps to answer the questions we posed. In all cases, technology is a key component in how these processes are designed or redesigned. For example, while discussed under the servitization theme, the use of technologies to monitor product usage and identify unusually high resource consumption also has implications for sustainability. By identifying research questions relating technologies such as IoT, RFID, sensing, and self-service technologies to the service operations themes across the board, we recognize the overarching role that technology has on service operations and the many issues that remain to be explored.

The opportunities for researchers to better understand the role of technology within and across themes is vast. Some issues to consider include how technologies can best be used to trace and coordinate service supply networks, as well as customer concerns about data privacy and its impact on the availability and use of customer data in service operations. We propose research questions about technology as a performance driver (e.g. IoT devices with enhanced analytical capabilities), as a facilitator (i.e., apps that align customer behavior with

desired actions), as a substitute for customer and/or employee service efforts (e.g. self-service technologies), and as a means to target increasingly smaller operating segments (e.g. virtual reality, artificial intelligence, and avatars applied to sharing economy operational processes). With rapidly changing technology increasingly integral to the design and implementation of service operations, new technologies that inspire new questions will continue to provide opportunities for leading-edge research.

10.4 Service operations: "what's next?"

Going back to the beginning and to conclude this article, we now ask again, "what's next?" Clearly, the service operations field has a plethora of research opportunities, some of which we outline here. Moreover, as demonstrated in the *JOSM* literature review in the companion article, "Service Operations: What Have We Learned?" (Victorino *et al.*, 2018), and further reinforced in the current article, service operations research is increasingly integrative not only across multiple themes within operations and but also across multiple functional disciplines. This creates opportunities for ever more impactful research with a wider reach throughout the service system and suggests that service researchers, regardless of their functional affiliation, can contribute to the ongoing conversation on the role of service operations in value creation. Thus, we reiterate our call for service operations researchers to continue to create deep knowledge within the field, while also encouraging service researchers across disciplines to pursue collaborative research that develops and incorporates insights related to these and other exciting and innovative research opportunities.

Figure 1: A conceptual typology of sharing economy services: Three dimensions*

1) Primary Sharing Function Types

- Share content (e.g. information, ideas, media, and "how to")
- Use excess capacity temporally (e.g. tangible assets and human assets)
- Transfer ownership of tangible value (e.g. money, gifts, and physical goods/assets)
- Create intangible value (e.g. communities, social networks, experiences, learning/know-how, and innovation)

2) Generic Transaction Types for Sharing

Giving and Non-Monetary Exchange — *Either* — *Monetary Exchanges*

Giving | Volunteering | Swapping | Sharing/Collaborating | Financial Services | Renting | Retailing

Talent/Learning

Entertaining

3) Noneconomic and Economic Incentive Mechanisms for Service Providers' and Receivers' Participation

Intrinsic Value

Individual's subjective enjoyment of sharing that is often associated with norms and beliefs (e.g. moral, ethical, environmental) consistent with altruistic behaviors**

Extrinsic (Utility) Value

Individual's subjective view of the prospective usefulness from sharing that is instrumental in achieving a personal goal (e.g. monetary benefits, status, power, friends, know-how, risk sharing)**

**See Appendix A for illustrative examples of sharing economy organizations within each dimension and type*
***Hoffman, 2015; Ryan and Deci, 2000*

Table 1: Themes, Topics, and Summary of Research Questions

Themes	Topics	Summary of Research Questions
Service Supply Networks	Frameworks for analyzing SSNs	– What frameworks and/or tools can be used to map and analyze SSNs and the operational implications of different network configurations? – How can we account for the temporal dimension of SSNs?
	Coordination and governance of SSNs	– What are the operational performance impacts of different coordination mechanisms on the whole network and individual members?
	Service failures in the SSN	– How can risks be managed in service supply networks? – How do characteristics of SSNs influence customer attribution of blame?
Evaluating and Measuring Service Operations Performance	Collection of data	– What role should the customer play in the data collection process? – What should be the operational processes around the collection of data?
	Analysis of data	– What are the best approaches for analyzing big data to inform operational decision making? – How does the proliferation of data sources and channels for dissemination (e.g. from non-customers and through social media, respectively) impact the evaluation of services and their operations?
	Use of data	– How can service providers use big data for service design and decision making?
Understanding Customer and Employee Behavior in Service Operations	Managing productivity and effectiveness of the service effort	– What can be learned from social and cognitive psychology to improve the productivity and effectiveness of the service effort? – How do state-dependent elements influence the productivity and effectiveness of service employees?
	Designing customer experiences	– How can service design and delivery inspire or manage behavior-influencers such as emotions, trust, and perceived control?
	Affect-based service scheduling	– How can behavioral principles be used to inform affect-based service scheduling? – What operational considerations make affect-based service scheduling feasible?

Table 1 cont'd

Themes	Topics	Summary of Research Questions
Managing Servitization	Rethinking product-centric business models	– What product design changes are most beneficial when moving to servitization? – How are servitization operating models similar or different across industry contexts and servitization types (e.g. hybrid models)?
	Redesigning resource configurations and processes	– What are the resource configurations that are important at each servitization stage and business context (B2B vs. B2C)?
	Enhancing sustainability through servitization	– How can firm and customer environmental preferences and be aligned with servitized product and process designs? – How can servitization contribute to, or even detract from, sustainability?
	Creating contracts for changing customer attitudes	– How should contracts be structured to ensure operational benefits, including coordination and risk management?
Managing Knowledge-Based Service Contexts	Innovations in health care for enhanced patient experiences	– How can the impact of health care innovations be assessed and improved?
	Dynamic knowledge-based work	– How does the rapidly changing nature of knowledge-based work impact service operations?
	Complex knowledge-based service systems	– Do we need new frameworks to design and manage complex knowledge-based service systems?

Table 1 cont'd

Themes	Topics	Summary of Research Questions
Managing Participation Roles and Responsibilities in Service Operations	Allocating more work to customers	– What are the factors (e.g. organizational, technological, customer-specific) that impact customer co-production effectiveness? – What operational role should employees play in environments with high customer co-production?
	Integration of resources for value creation	– How do we integrate and align the efforts of customers and employees to enhance operational performance? – How do we unlock relevant customer and employee information to bring about improved service performance?
	Omni-channel participation roles and responsibilities	– How can service delivery across channels be coordinated to meet customer needs?
Addressing Society's Challenges through Service Operations	Sustainable services	– How can we shape employee, customer, and other network partner behaviors to be more sustainable? – How can operational processes be designed to promote well-being of service participants? – How does eco-certification help achieve better environmental, social, and operational performance?
	Social impact services	– How should operational processes be designed for complex social impact services and systems? – How can we better understand and address the unique operational challenges of managing social impact services?
	Frameworks and metrics for sustainable services and social impact services	– What existing or new frameworks can be used to understand sustainable services and social impact services from multiple stakeholder perspectives? – What is the appropriate mix of metrics to evaluate sustainable services and social impact services?

Table 1 cont'd

Themes	Topics	Summary of Research Questions
Operational Implications of the Sharing Economy	Duality of customer co-production	– How is operational performance affected by the duality of customer co-production? – What behavioral research is relevant to the sharing economy environment, especially as it relates to the duality of customer co-production?
	Value creation with asset-light operations	– What are the operational and other contributors to growth and sustainability of asset-light sharing economy firms? – What existing or new theories and models can be applied in this extreme asset-light context?
	Deep customization of the service offering for heterogeneous market (operating) segments	– What strategic operational choices, capabilities, and technologies are needed to deliver a targeted portfolio of sharing economy services to heterogeneous customers comprising smaller and smaller operating segments?
	Sharing economy conceptual typology	– How should the operations of sharing economy services be designed and managed across various combinations of function types, transaction types, and incentive mechanisms?

References

Agrawal, V.V. and Bellos, I. (2016), “The potential of servicizing as a green business model”, *Management Science*, Vol. 63 No. 5, pp. 1545-1562.

Atzori, L., Iera, A. and Morabito, G. (2010), "The Internet of things: a survey", *Computer Networks*, Vol. 54 No. 15, pp. 2787-2805.

Baines, T., Bigdeli, A.Z., Bustinza, O.F., Shi, V.G., Baldwin, J. and Ridgway, K. (2017), “Servitization: revisiting the state-of-the-art and research priorities”, *International Journal of Operations and Production Management*, Vol. 37 No. 2, pp. 256-278.

Baines, T., Lightfoot, H., Peppard, J., Johnson, M., Tiwari, A., Shehab, E. and Swink, M. (2009), “Towards an operations strategy for product-centric servitization”, *International Journal of Operations and Production Management*, Vol. 29 No. 5, pp. 494-519.

Barile, S., Lusch, R., Reynoso, J., Saviano, M. and Spohrer, J. (2016), “Systems, networks, and ecosystems in service research”, *Journal of Service Management*, Vol. 27 No. 4, pp. 652-674.

Battilana, J. and Lee, M. (2014), “Advancing research on hybrid organizing - insights from the study of social enterprises”, *Academy of Management Annals*, Vol. 8 No. 1, pp. 397-441.

Bavafa, H., Hitt, L.M. and Terwiesch, C. (2017), “The impact of e-visits on visit frequencies and patient health: evidence from primary care”, available at SSRN: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2363705 (accessed on 14 April 2017).

Bell, D.R., Gallino, S. and Moreno, A. (2017), “Offline showrooms in omnichannel retail: demand and operational benefits”, *Management Science*, forthcoming, available at: http://pubsonline.informs.org/doi/pdf/10.1287/mnsc.2016.2684.

Bell, D.R., Gallino, S. and Moreno, A. (2014), “How to win in an omnichannel world”, *Sloan Management Review*, Vol. 56 No. 1, pp. 45-54.

Bendapudi, N. and Leone, R.P. (2003), “Psychological implications of customer participation in co-production”, *Journal of Marketing*, Vol. 67 No. 1, pp. 14-28.

Bendoly, E., van Wezel, W. and Bachrach, D.G. (2015), *The Handbook of Behavioral Operations Management*, Oxford University Press, New York, NY.

Bettencourt, L.A., Ostrom, A.L., Brown, S.W. and Roundtree R.I. (2002), "Client co-production in knowledge-intensive business services", *California Management Review*, Vol. 44 No. 4, pp. 100-128.

Bitner, M.J., Booms, B.H. and Tetreault, M.S. (1990), “The service encounter: diagnosing favorable and unfavorable incidents”, *The Journal of Marketing*, Vol. 54 No. 1, pp. 71-84.

Black, H.G. and Gallan, A.S. (2015), “Transformative service networks: co-created value as well-being”, *The Service Industries Journal*, Vol. 35 No. 15-16, pp. 826-845.

Blackler, F., Reed, M. and Whitaker, A. (1993), “Editorial introduction: knowledge workers and contemporary organizations”, *Journal of Management Studies*, Vol. 30 No. 6, pp. 851-862.

Botsman, R. (2015), “Defining the sharing economy: what is collaborative consumption—and what it isn’t,” *Fast Company*, 27 May, available at: https://www.fastcompany.com/3046119/defining-the-sharing-economy-what-is-collaborative-consumption-and-what-isnt (accessed 31 July 2017).

Boudreau, J., Hopp, W., McClain, J.O. and Thomas, L.J. (2003), "On the interface between operations and human resources management", *Manufacturing and Service Operations Management*, Vol. 5 No. 3, pp. 179-202.

Bowen, D. (1986), “Managing customers as human resources in service organizations”, *Human Resource Management Review*, Vol. 25 No. 3, pp. 371-383.

Bowen, D.E. (2016), "The changing role of employees in service theory and practice: an interdisciplinary view", *Human Resource Management Review*, Vol. 26 No. 1, pp. 4-13.

Bowen, D.E. and Jones, G.R. (1986), “Transaction cost analysis of service organization-customer exchange”, *Academy of Management Review*, Vol. 11 No. 2, pp. 428-441.

Brown, B., Chui, M. and Manyika, J. (2011), “Are you ready for the era of ‘big data’?”, *McKinsey Quarterly*, Vol. 4 No. 1, pp. 24-35.

Buchanan, R. (2004), "Human-centered design: changing perspectives on design education in the East and West", *Design Issues*, Vol. 20 No. 1, pp. 30-39.

Buell, R.W. and Norton, M.I. (2011), “The labor illusion: how operational transparency increases perceived value”, *Management Science*, Vol. 57 No. 9, pp. 1564-1579.

Buell, R.W., Campbell, D. and Frei, F.X. (2010), “Are self-service customers satisfied or stuck?”, *Production and Operation Management*, Vol. 19 No. 6, pp. 679-697.

Buell, R.W., Campbell, D. and Frei, F.X. (2016a), “The customer may not always be right: customer compatibility and service performance”, working paper [16-091], Harvard Business School, Harvard University, Cambridge, MA, February.

Buell, R.W., Kim, T. and Tsay, C.J. (2016b), “Creating reciprocal value through operational transparency”, *Management Science*, Vol. 63 No. 6, pp. 1673-1695.

Butler, R.W. (1999), "Sustainable tourism: a state of the art review”, *Tourism Geographies*, Vol. 1 No. 1, pp. 7-25.

Byrd, E.T. (2007), "Stakeholders in sustainable tourism development and their roles: applying stakeholder theory to sustainable tourism development", *Tourism Review*, Vol. 62 No. 2, pp. 6-13.

Campbell, D. and Frei, F. (2010), “The cost structure, customer profitability, and retention implications of self-service distribution channels: evidence from customer behavior in an online banking channel”, *Management Science*, Vol. 56 No. 1, pp. 4-24.

Carter, C.R. and Rogers, D.S. (2008), "A framework of sustainable supply chain management: moving toward new theory", *International Journal of Physical Distribution and Logistics Management*, Vol. 38 No. 5, pp. 360-387.

Carter-Pokras, O. and Baquet, C. (2002). "What is a ‘health disparity’?”, *Public Health Reports*, Vol. 117 No. 5, pp. 426-434.

Chase, R.B. (1978), “Where does the customer fit in a service operation?”, *Harvard Business Review*, Vol. 56 No. 6, pp. 137-142.

Chase, R.B. and Apte, U.M. (2007), "A history of research in service operations: what's the big idea?", *Journal of Operations Management*, Vol. 25 No. 2, pp. 375-386.

Chase, R.B. and Dasu, S. (2001), "Want to perfect your company's service? Use behavioral science", *Harvard Business Review*, Vol. 79 No. 6, pp. 78-84.

Chen, H., Chiang, R. H. and Storey, V. C. (2012), “Business intelligence and analytics: from big data to big impact”, *Management Information Systems Quarterly*, Vol. 36 No. 4, pp. 1165-1188.

Chun, H. and Giebelhausen, M. (2012), “Reversing the green backlash in services: credible competitors help large companies go green”, *Journal of Service Management*, Vol. 23 No. 3, pp. 400-415.

Clarke, J. (1997), "A framework of approaches to sustainable tourism*", Journal of Sustainable Tourism*, Vol. 5 No. 3, pp. 224-233.

Collier, J.E. and Sherrell, D.L. (2010), “Examining the influence of control and convenience in a self-service setting”, *Journal of the Academy of Marketing Science*, Vol. 38 No. 4, pp. 490-509.

Cook, L.S., Bowen, D.E., Chase, R.B., Dasu, S., Stewart, D.M. and Tansik, D.A. (2002), "Human issues in service design", *Journal of Operations Management*, Vol. 20 No. 2, pp. 159-174.

Corbett, C.J. and Klassen, R.D. (2006), “Extending the horizons: environmental excellence as key to improving operations”, *Manufacturing and Service Operations Management*, Vol. 8 No. 1, pp. 5-22.

Costa, E. and Pesci, C. (2016), “Social impact measurement: why do stakeholders matter?”, *Sustainability Accounting, Management and Policy Journal*, Vol. 7 No. 1, pp.99-124.

Croson, R., Schultz, K., Siemsen, E. and Yeo, M.L. (2013), “Behavioral operations: the state of the field”, *Journal of Operations Management*, Vol. 31 No. 1, pp. 1-5.

Cummings, R., Echenique, F. and Wierman, A. (2016), “The empirical implications of privacy-aware choice”, *Operations Research*, Vol. 64 No. 1, pp. 67-78.

Dacin, M.T., Dacin, P.A. and Tracey, P. (2011), "Social entrepreneurship: a critique and future directions", *Organization Science*, Vol. 22 No. 5, pp. 1203-1213.

Das Gupta, A., Karmarkar, U.S. and Roels, G. (2016). “The design of experiential services with acclimation and memory decay: optimal sequence and duration”, *Management Science*, Vol. 62 No. 5, pp. 1278–1296.

Dasu, S. and Chase, R.B. (2010), "Designing the soft side of customer service", *Sloan Management Review*, Vol. 52 No. 1, pp. 33-39.

Dasu, S. and Chase, R.B. (2013), *The Customer Service Solution - Managing Emotions, Trust, and Control to Win Your Customer's Business*, McGraw Hill Education, New York, NY.

Dixon, M.J. and Thompson, G. (2013), “The impact of timing and bundling flexibility on affect-based service package design”, working paper, 3 April, available at: https://ssrn.com/abstract=2244529 or http://dx.doi.org/10.2139/ssrn.2244529.

Dixon, M.J. and Thompson, G.M. (2016). “Bundling and scheduling service packages with customer behavior: model and heuristic”, *Production and Operations Management*, Vol. 25 No. 1, pp. 36–55.

Dixon, M.J. and Verma, R. (2013). “Sequence effects in service bundles: implications for service design and scheduling”, *Journal of Operations Management*, Vol. 31 No. 3, pp. 138–152.

Dixon, M.J. and Victorino, L. (2017). “The sequence of service”, available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2955800 (accessed 17 June 2017).

Dixon, M.J., Victorino, L., Kwortnik, R.J. and Verma, R. (2017), “Surprise, anticipation, and sequence effects in the design of experiential services”, *Production and Operations Management*, Vol. 26 No. 5, pp. 945-960.

Doerr, K.H., Mitchell, T.R., Klastorin, T.D. and Brown, K.A. (1996). “Impact of material flow policies and goals on job outcomes”, *Journal of Applied Psychology*, Vol. 81 No. 2, p. 142.

Dunne, D. and Martin, R. (2006), "Design thinking and how It will change management education: an interview and discussion", *Academy of Management Learning and Education,* Vol. 5 No. 4, pp. 512-23.

Eggert, A., Hogreve, J., Ulaga, W. and Muenkjoff, E. (2014), “Revenue and profit implications of industrial service strategies”, *Journal of Service Research*, Vol. 17 No. 1, pp. 23-39.

Ekman, P., Raggio, R.D. and Thompson, S.M. (2016), “Service network value co-creation: defining the roles of the generic actor”, *Industrial Marketing Management*, Vol. 56, pp. 51-62.

Evans, D.S and Schmalensee, R. (2016), *Matchmakers: The New Economics of Multisided Platforms*, Harvard Business Press, Boston, MA.

Field, J.M. (2016), *Designing Service Processes to Unlock Value 2nd Edition*, Business Expert Press, New York, NY.

Field, J.M. and Meile, L.C. (2008), “Supplier relations and supply chain performance in financial services processes”, *International Journal of Operations and Production Management*, Vol. 28 No. 2, pp. 185-206.

Field, J.M., Heim, G.R. and Sinha, K.K. (2004), “Managing quality in the e-service system: development and application of a process model”, *Production and Operations Management*, Vol. 13 No. 3, pp. 291-306.

Fioretti, G. (2013), “Agent-based simulation models in organization science”, *Organizational Research Methods*, Vol. 16 No. 2, pp. 227-242.

Fiscella, K., Franks, P., Gold, M.R. and Clancy, M.C. (2000). "Inequality in quality: addressing socioeconomic, racial, and ethnic disparities in health care", *Journal of the American Medical Association*, Vol. 283 No. 19, pp. 2579-2584.

Fischer, T., Gebauer, H., Gregory, M., Ren, G. and Fleisch, E. (2010), “Exploitation or exploration in service business development?: insights from a dynamic capabilities perspective”, *Journal of Service Management*, Vol. 21 No. 5, pp. 591-624.

Fredendall, L.D., Craig, J.B., Fowler, P.J. and Damali, U. (2009), “Barriers to swift, even flow in the internal supply chain of perioperative surgical services department: a case study”, *Decision Sciences*, Vol. 40 No. 2, pp. 327-349.

Frei, F. (2006), “Breaking the trade-off between efficiency and service,” *Harvard Business Review*, Vol. 84 No. 11, pp. 92-101.

Frei, F. and Morris, A. (2012), *How to Win by Putting Customers at the Core of Your Business*, Harvard Business Press, Boston, MA.

Froehle, C.M. and Roth, A.V. (2004), “New measurement scales for evaluating perceptions of the technology-mediated customer service experience”, *Journal of Operations Management*, Vol. 22 No. 1, pp. 1-21.

Gallino, S. and Moreno, A. (2014), “Integration of online and offline channels in retail: the impact of sharing reliable inventory availability information”, *Management Science*, Vol. 60 No. 6, pp. 1434-1451.

Gallino, S., Moreno, A, and Stamatopoulos, I. (2017), “Channel integration, sales dispersion, and inventory management”, *Management Science*, Vol. 63 No. 9, pp. 2813-2831.

Garrett, O. (2017), “The 4 best P2P lending platforms for Investors in 2017—detailed analysis”, *Forbes*, 29 January, available at: https://www.forbes.com/sites/oliviergarret/2017/01/29/the-4-best-p2p-lending-platforms-for-investors-in-2017-detailed-analysis/2/#4b024fbc15cc (accessed 12 October 2017).

Gao, F. and Su, X. (2016), “Online and offline Information for omnichannel retailing”, *Manufacturing and Service Operations Management,* Vol. 19 No. 1, pp. 93

Gebauer, H., Edvardsson, B., Gustafsson, A. and Witell, L. (2010a), “Match or mismatch: strategy-structure configurations in the service business of manufacturing companies”, *Journal of Service Research*, Vol. 13 No. 2, pp. 198-215.

Gebauer, H., Fischer, T. and Fleisch, E. (2010b), “Exploring the interrelationship among patterns of service strategy changes and organization design elements”, *Journal of Service Management*, Vol. 21 No. 1, pp. 103-129.

Glushko, R.J. and Nomorosa, K.J. (2013), “Substituting information for interaction: a framework for personalization in service encounters and service systems”, *Journal of Service Research*, Vol. 16 No. 1, pp. 21-38.

Golden, B.L. and Seidmann, A. (2012), "Introduction to the special issue on applications of healthcare operations management", *Manufacturing and Service Operations Management*, Vol. 14 No. 4, pp. 485-87.

Goldfarb, A., McDevitt, R.C., Samila, S. and Silverman, B.S. (2015), “The effect of social interaction on economic transactions: evidence from changes in two retail formats”, *Management Science*, Vol. 61 No. 12, pp. 2963-2981.

Grant, A.M. (2007), “Relational job design and the motivation to make a prosocial difference”, *Academy of Management Review*, Vol. 32 No. 2, pp. 393-417.

Grant, A.M., Campbell, E.M., Chen, G., Cottone, K., Lapedis, D. and Lee, K. (2007), “Impact and the art of motivation maintenance: the effects of contact with beneficiaries on persistence behavior”, *Organizational Behavior and Human Decision Processes*, Vol. 103 No. 1, pp. 53-67.

Gremler, D.D. and Gwinner, K.P. (2000). “Customer-employee rapport in service relationships”, *Journal of Service Research*, Vol. 3 No. 8, pp. 82–104.

Guajardo, J.A., Cohen, M.A., Kim, S.H. and Netissine, S. (2012), “Impact of performance-based contracting on product reliability: an empirical analysis”, *Management Science*, Vol. 58 No. 5, pp. 961-979.

Gubbi, J., Buyya, R., Marusic, S. and Palaniswami, M. (2013) "Internet of Things (IoT): a vision, architectural elements, and future directions", *Future Generation Computer Systems*, Vol. 29 No. 7, pp. 1645-60.

Gulati, R. (1998), “Alliances and networks”, *Strategic Management Journal*, Vol. 19 No. 4, pp. 293-317.

Gummesson, E. (2008), “Extending the service-dominant logic: from customer centricity to balanced centricity”, *Journal of the Academy of Marketing Science*, Vol. 36 No. 1, pp. 15-17.

Haas, C., Kimbrough, S.O. and Van Dinther, C. (2013), “Strategic learning by e-service suppliers in service value networks”, *Journal of Service Research*, Vol. 16 No. 3, pp. 259-276.

Hanemann, W.M. (1991), “Willingness to pay and willingness to accept: how much can they differ?”, *The American Economic Review*, Vol. 81 No. 3, pp. 635-647.

Hartline, M. and Ferrell, O. (1996).” The management of customer-contact service employees: an empirical investigation”, *Journal of Marketing*, Vol. 60 No. 4, pp. 52-70.

Hartmann, P. M., Zaki, M., Feldmann, N. and Neely, A. (2014), “Big data for big business? A taxonomy of data-driven business models used by start-up firms”, available at: http://www.nsuchaud.fr/wp-content/uploads/2014/08/Big-Data-for-Big-Business-A-Taxonomy-of-Data-driven-Business-Models-used-by-Start-up-Firm.pdf (accessed 14 April 2017).

Harvey, J. (2016), “Professional service supply chains”, *Journal of Operations Management*, Vol. 42-43, pp. 52-61.

Harvey, J., Heineke, J. and Lewis, M. (2016), "Editorial for journal of operations management special issue on 'professional service operations management (PSOM)'", *Journal of Operations Management*, Vol. 42-43, pp. 4-8.

Haywood-Farmer, J. (1988), "A conceptual model of service quality*", International Journal of Operations and Production Management*, Vol. 8 No. 6, pp. 19-29.

Heidenreich, S., Wittkowski, K., Handrich, M. and Falk, T. (2015), “The dark side of customer co-creation: exploring the consequences of failed co-created services”, *Journal of the Academy of Marketing Science*, Vol. 43 No. 3, pp. 279-296.

Heim, G.R. and Field, J.M. (2007), “Process drivers of e-service quality: analysis of data from an online rating site”, *Journal of Operations Management*, Vol. 25 No. 5, pp. 962-984.

Heskett, J.L., Jones, T.O., Loveman, G.W., Sasser Jr., W.E. and Schlesinger, L.A. (1994), "Putting the service-profit chain to work," *Harvard Business Review*, Vol. 72 No. 2, pp. 164-175.

Heskett, J.L., Sasser, W. E. and Hart, C.W.L. (1990), S*ervice Breakthrough: Changing the Rules of the Game*, The Free Press, New York, NY.

Heskett, J.L., Sasser, W.E. and Schlesinger, L.A. (1997), *The Service Profit-Chain*, The Free Press, New York, NY.

Hilton, T., Hughes, T., Little, E. and Marandi, E. (2011), "Adopting self-service technology to do more with less", *Journal of Services Marketing*, Vol. 27 No. 1, pp. 103-113.

Hinings, C.R. and Leblebici, H. (2003), "Editorial introduction to the special issue: knowledge and professional organizations", *Organization Studies*, Vol. 24 No. 6, pp. 827-830.

Hoffman, B. (2015), *Motivation for Learning and Performance*, Academic Press, San Diego, CA.

Hsieh, A., Yen, C. and Chin, K. (2004), "Participative customers as partial employees and service provider workload", *International Journal of Service Industry Management*, Vol. 15 No. 2, pp. 187-199.

Hsieh, A.T. and Yen, C.H. (2005), "The effect of customer participation on service providers' job stress", *Services Industry Journal*, Vol. 25 No. 7, pp. 891-905.

Hypko, P., Tilebein, M. and Gleich, R. (2010a), "Benefits and uncertainties of performance-based contracting in manufacturing industries", *Journal of Service Management*, Vol. 21 No. 4, pp. 460-489.

Hypko, P., Tilebein, M. and Gleich, R. (2010b), "Clarifying the concept of performance-based contracting in manufacturing industries: a research synthesis", *Journal of Service Management*, Vol. 21 No. 5, pp. 625-655.

John, L.K. (2015), "The consumer psychology of online privacy: insights and opportunities from behavioral decision theory", in: Norton, M.I., Rucker, D.D., Lamberton, C. (Eds.), *Cambridge Handbook of Consumer Psychology*, Cambridge University Press, New York, NY, pp. 619-646.

Josephson, B.W., Johnson, J.L., Mariadoss, B.J. and Cullen, J. (2016), "Service transition strategies in manufacturing: implications for firm risk", *Journal of Service Research*, Vol. 19 No. 2, pp. 142-157.

Kahneman, D. (2003), "Maps of bounded rationality: psychology for behavioral economics", *The American Economic Review*, Vol. 93 No. 5, pp. 1449-1475.

Kahneman, D., Rosenfield, A., Gandhi, L. and Blaser, T. (2016), "Noise: how to overcome the high, hidden cost of inconsistent decision making", *Harvard Business Review*, Vol. 94 No. 10, pp. 38-46.

Kaissi, A. (2012), "'Learning' from other industries: lessons and challenges for health care organizations", *The Health Care Manager*, Vol. 31 No. 1, pp. 65-74.

Karmarkar, U.S., Kim, K. and Rhim, H. (2015), “Industrialization, productivity and the shift to services and information”, *Production and Operations Management*, Vol. 24 No. 11, pp. 1675-1695.

Kassinis, G.I. and Soteriou, A.C. (2003), "Greening the service profit chain: the impact of environmental management practices", *Production and Operations Management*, Vol. 12 No. 3, pp. 386-403.

Kelley, S.W., Donnelly, Jr., J.H. and Skinner, S.J. (1990), “Customer participation in service production and delivery”, *Journal of Retailing*, Vol. 66 No. 3, pp. 315-335.

Knowles, K. (2017), “Vizeat is the delicious ‘Airbnb of food’”, *Travel*, 3 July, available at: https://www.thememo.com/2017/07/03/vizeat-founder-airbnb-travel-food-dinner-experiences-sharing-economy/ (accessed 12 October 2017).

Koza, M.P. and Lewin, A.Y. (1998), “The co-evolution of strategic alliances”, *Organization Science*, Vol. 9 No. 3, pp. 255-264.

Kuang, C. (2015), “Disney's $1 billion bet on a magical wristband”, available at: https://www.wired.com/2015/03/disney-magicband/ (accessed 28 June 2017).

Larsson, R. and Bowen, D.E. (1989), “Organization and customer: managing design and coordination of services”, *Academy of Management Review*, Vol. 14 No. 2, pp. 213-233.

Lawrence, B., Zhang, J.J. and Heineke, J. (2016), "A life-cycle perspective of professionalism in services", *Journal of Operations Management*, Vol. 42-43, pp. 25-38.

Lay, G., Copani, G., Jager, A. and Biege, S. (2010), “The relevance of service in European manufacturing industries”, *Journal of Service Management*, Vol. 21 No. 5, pp. 715-726.

Lee, M., Verma, R. and Roth, A.V. (2015), “Understanding customer value in technology-enabled services: a numerical taxonomy based on usage and utility”, Service Science, Vol. 7 No. 3, pp. 227-248.

Lewis, M.A. and Brown, A.D., (2012), "How different Is professional service operations management?", *Journal of Operations Management*, Vol. 30 No. 1-2, pp. 1-11.

Li, M. and Choi, T.Y. (2009), “Triads in services outsourcing: bridge, bridge decay and bridge transfer”, *Journal of Supply Chain Management*, Vol. 45 No.3, pp. 27-39.

Libert, B., Beck, M. and Wind, Y. (2016) “Investors today prefer companies with fewer physical assets,” *Harvard Business Review Digital Articles*, available at:

https://hbr.org/2016/09/investors-today-prefer-companies-with-fewer-physical-assets (accessed 31 July 2017).

Lightfoot, H., Baines, T. and Smart, P. (2013), “The servitization of manufacturing: a systematic literature review of interdependent trends”, *International Journal of Operations and Production Management*, Vol. 33 No. 11-12, pp. 1408-1434.

Lin, J.S.C. and Chang, H.C. (2011), “The role of technology readiness in self-service technology acceptance”, *Managing Service Quality*, Vol. 21 No. 4, pp. 424-444.

Lim, M.K., Mak, H. and Rong, Y. (2015), “Toward mass adoption of electric vehicles: impact of the range and resale anxieties”, *Manufacturing and Service Operations Management*, Vol. 17 No. 1, pp. 101-119.

Lipkin, M. (2016), "Customer experience formation in today's service landscape", *Journal of Service Management*, Vol. 27 No. 5, pp. 678-703.

Lovelock, C.H. (1983), "Classifying services to gain strategic marketing insights", *Journal of Marketing*, Vol. 47 No. 3 pp. 9-20.

Løwendahl, B.R, Revang, Ø. and Fosstenløkken, S.M. (2001), "Knowledge and value creation in professional service firms: a framework for analysis", *Human Relations*, Vol. 54 No. 7, pp. 911-31.

Løwendahl, B.R. (2005), *Strategic Management of Professional Service Firms*, Copenhagen Business School Press, Copenhagen, DK.

Lusch, R., Liu, Y. and Chen, Y. (2010), “The phase transition of markets and organizations: the new intelligence and entrepreneurial frontier”, *IEEE Intelligent Systems*, Vol. 25 No. 1, pp. 71-75.

Lusch, R.F. and Vargo, S.L. (2006), “Service-dominant logic: reactions, reflections and refinements”, *Marketing Theory*, Vol. 6 No. 3, pp. 281-288.

Maglio, P.P., Kwan, S.K. and Spohrer, J. (2015), “Toward a research agenda for human-centered service system innovation”, *Service Science*, Vol. 7 No. 1, pp. 1-10.

Malhotra, A. and Van Alstyne, M. (2014), “Economic and business dimensions: the dark side of the sharing economy and how to lighten it”, *Communications of the ACM*, Vol. 57 No. 7, pp. 24-27.

Manning, A. (2016), “All female ride-sharing app is launching nationwide after overwhelming demand,” *Observer*, 20 April 20, available at: http://observer.com/2016/04/all-female-ride-sharing-app-is-launching-nationwide-after-overwhelming-demand/ (accessed 2 May 2017).

Manyika, J., Chui, M., Brown, B., Bughin, J., Dobbs, R., Roxburgh, C. and Byers, A.H. (2011), "Big data: the next frontier for innovation, competition, and productivity", available at: http://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/big-data-the-next-frontier-for-innovation (accessed 17 October 2016).

Matheson, R. (2015). "A smart inhaler for people with asthma", *MIT News*, available at: http://news.mit.edu/2015/gecko-health-smart-inhaler-asthma-1028 (accessed 28 June 2017).

Matofska, B. (2016), "What is the sharing economy?," available at: http://www.thepeoplewhoshare.com/blog/what-is-the-sharing-economy/ (accessed 31 July 2017).

Mayer-Schönberger, V. and Cukier, K. (2013), *Big Data: A Revolution That Will Transform How We Live, Work, and Think*, Houghton Mifflin Harcourt, New York, NY.

McAfee, A. and Brynjolfsson, E. (2017), *Machine, Platform, Crowd: Harnessing Our Digital Future*, W.W. Norton & Co., New York NY.

McAfee, A., Brynjolfsson, E., Davenport, T. H., Patil, D. J. and Barton, D. (2012), "Big data: the management revolution", *Harvard Business Review*, Vol. 90 No. 10, pp. 61-67.

McColl-Kennedy, J.R., Snyder, H., Snyder, H., Elg, M., Witell, L., Helkkula, A. and Hogan, S.J. (2017), "The changing role of the health care customer: review, synthesis and research agenda", *Journal of Service Management*, Vol. 28 No.1, pp. 2-33.

McPhee, W. (2014), "A new sustainability model: engaging the entire firm", *Journal of Business Strategy*, Vol. 35 No. 2, pp. 4-12.

Medina-Borja, A. (2015), "Editorial column-smart things as service providers: a call for convergence of disciplines to build a research agenda for the service systems of the future", *Service Science*, Vol. 7 No. 1, pp. 2-5.

Metters, R. and Vargas V. (2000), "A typology of de-coupling strategies in mixed services," *Journal of Operations Management*, Vol. 18 No. 6, pp. 663-682.

Meuter, M., Bitner, M., Ostrom, A. and Brown, S. (2005), "Choosing among alternative service delivery modes: an investigation of customer trial of self-service technologies", *Journal of Marketing*, Vol. 69 No. 2, pp. 61-83.

Meuter, M., Ostrom, A., Roundtree, R. and Bitner, M. (2000), "Self-service technologies: understanding customer satisfaction with technology-based service encounters", *Journal of Marketing*, Vol. 64 No. 3, pp. 50-64.

Miller, J.H. and Page, S.E. (2009), *Complex Adaptive Systems: An Introduction to Computational Models of Social Life*, Princeton University Press, Princeton, NJ.

Mills, P.K., Hall, J.L., Leidecker, J.K. and Margulies, N. (1983), "Flexiform: a model for professional service organizations", *Academy of Management Review*, Vol. 8 No. 1, pp. 118-131.

Moxham, C. and Kauppi, K. (2014), "Using organisational theories to further our understanding of socially sustainable supply chains: the case of fair trade", *Supply Chain Management: An International Journal*, Vol. 19 No. 4, pp. 413-420.

Mustak, M., Jaakkola, E., Halinen, A. and Kaartermo, V. (2016), "Customer participation management - developing a comprehensive framework and a research agenda", *Journal of Service Management*, Vol. 27 No. 3, pp. 250-275.

Naor, M., Bernardes, E.S., Druehl, C.T. and Shiftan, Y. (2015), “Overcoming barriers to adoption of environmentally-friendly innovations through design and strategy: learning from the failure of an electric vehicle infrastructure firm”, *International Journal of Operations and Production Management*, Vol. 35 No. 1, pp. 26-59.

Neely, A. (2008), "Exploring the financial consequences of the servitization of manufacturing", *Operations Management Research*, Vol. 1 No. 2, pp. 103-118.

Newman, A.J., Yu, D.K.C. and Oulton, D.P. (2002), “New insights into retail space and format planning from customer-tracking data”, *Journal of Retailing and Consumer Services*, Vol. 9 No. 5, pp. 253-258.

Ng, I.C.L. and Nudurupati, S.S. (2010), “Outcome-based service contracts in the defence industry - mitigating the challenges”, *Journal of Service Management*, Vol. 21 No. 5, pp. 656-674.

O'Neil, C. (2016), *Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy*, Crown, New York, NY.

Ostrom, A.L., Parasuraman, A., Bowen, D.E., Patricio, L. and Voss, C.A. (2015), “Service research priorities in a rapidly changing context”, *Journal of Service Research*, Vol. 18 No. 2, pp. 127-159.

Pappano, L. (2012), "The Year of the MOOC", *The New York Times*, 4 November, p. ED26.

Parasuraman, A. (2000), “Technology readiness index (TRI): a multiple-item scale to measure readiness to embrace new technologies”, *Journal of Service Research*, Vol. 2 No. 4, pp. 307-321.

Parmigiani, A., Klassen, R.D. and Russo, M.V. (2011), “Efficiency meets accountability: performance implications of supply chain configuration, control, and capabilities”, *Journal of Operations Management*, Vol. 29 No. 3, pp. 212-223.

Patel, C. (2014), “8 platforms that enable gift giving, giving or transfer of money to friends and relative via social media”, available at: https://letstalkpayments.com/8-platforms-enable-gifting-giving-transfer-money-friends-relatives-via-social-media-503827/ (accessed 12 October 2017).

Paul, I. (2016), “BitTorrent hits Apple TV via a P2P livestreaming news app”, *Macworld*, 10 February, available at: https://www.macworld.com/article/3032062/data-center-cloud/bittorrent-comes-to-apple-tv-via-a-p2p-livestreaming-app.html/ (accessed 12 October 2017).

Peneder, M., Kaniovski, S. and Dachs, B. (2003), "What follows tertiarisation? Structural change and the role of knowledge-based services", *The Service Industries Journal*, Vol. 23 No. 2, pp. 47-66.

Pine II, B.J. and Gilmore, J.H. (2011), *The Experience Economy*, Harvard Business Review Press, Boston, MA.

Pine, B.J. and Gilmore, J.H. (1998), "Welcome to the experience economy", *Harvard Business Review*, Vol. 76 No. 6, pp. 97-105.

Powell, S.G., and Schultz, K.L. (2004).” Throughput in serial lines with state-dependent behavior”, *Management Science*, Vol. 50 No. 8, pp. 1095–1105.

Pullman, M. and Rainey, K. (2016), “Minimizing food waste at Google: creating production innovation and purchasing practices”, in Cagliano, R., Caniato, F. and Workey C. (Eds.), *Organizing Supply Chain Processes for Sustainable Innovation in the Agri-Food Industry*, Emerald Group Publishing Limited, Bingley, UK, pp. 127-152.

Raddats, C. and Burton, J. (2011), “Strategy and structure configurations for services within product-centric businesses”, *Journal of Service Management*, Vol. 22 No. 4, pp. 522-539.

Ramaswamy, V. (2006), “Co-creating experiences of value with customers”, *SETLabs Briefings*, Vol. 4 No. 1, pp. 25-36.

Retana, G.F., Forman, C. and Wu, D.J. (2016), “Proactive customer education, customer retention, and demand for technology support: evidence from a field experiment”, *Manufacturing and Service Operations Management*, Vol. 18 No. 1, pp. 34-50.

Revesencio, J. (2015), “These companies prove you don’t’ need to ‘own’ anything to be successful,” *THE BLOG*, 27 June, available at: http://www.huffingtonpost.com/jonha-revesencio/these-companies-prove-you_b_7157626.html (accessed 2 May 2017).

Roels, G. (2014), “Optimal design of coproductive services: interaction and work allocation”, *Manufacturing and Service Operations Management*, Vol. 16 No. 4, pp. 578-594.

Roels, G., Karmarkar, U.S .and Carr, S. (2010), "Contracting for collaborative services", *Management Science*, Vol. 56 No. 5, pp. 849-863.

Romero, D. and Molina, A. (2011), “Collaborative networked organisations and customer communities: value co-creation and co-innovation in the networking era”, *Production Planning and Control*, Vol. 22 No. 5-6, pp. 447-472.

Roth, A.V. and Menor, L.J. (2003), “Insights into service operations management: a research agenda”, *Production and Operations Management*, Vol. 12 No. 2, pp. 145-164.

Roth, A.V. and van der Velde, M. (1991), “Operations as marketing: a competitive service strategy”, *Journal of Operations Management*, Vol. 10 No. 3, pp. 303-328.

Rubinstein, G. (2012), “Analyzing released NYC value-added data part 2”, available at: https://garyrubinstein.wordpress.com/2012/02/28/analyzing-released-nyc-value-added-data-part-2/ (accessed 14 April 2017).

Ryan, R.M and Deci, E.L. (2000), “Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being”, *American Psychologist*, Vol. 55 No. 1, pp. 68-78.

Sampson, S.E. (2012a), “Visualizing service operations”, *Journal of Service Research*, Vol. 15 No. 2, pp. 182-198.

Sampson, S.E. (2012b), *Essentials of Service Design: Developing High-Value Service Businesses with PCN Analysis, 2nd Edition*, CreateSpace Independent Publishing Platform, Charleston, SC.

Sampson, S.E. and Froehle, C.M. (2006), “Foundations and implications of a proposed unified services theory”, *Production and Operations Management*, Vol. 15 No. 2, pp. 329-343.

Sampson, S.E., Schmidt, G., Gardner, J.W. and Van Orden, J. (2015), “Process coordination within a health care service supply network”, *Journal of Business Logistics*, Vol. 36 No.4, pp. 355-373.

Sasser, W. E. (1976). “Match supply and demand in services”, *Harvard Business Review*, Vol. 54 No. 6, pp. 133-140.

Sawers, P. (2017), “Lemonade, the online insurance firm powered by ethics and chatbots, launches in California”, available at: https://venturebeat.com/2017/05/10/lemonade-the-online-insurance-firm-powered-by-ethics-and-chatbots-launches-in-california/ (accessed 12 October 2017).

Sawhney, M. (2016), "Putting products into services", *Harvard Business Review*, Vol. 94 No. 9, pp. 82-79.

Schmenner, R.W. (2004), “Service businesses and productivity”, *Decision Sciences*, Vol. 35 No. 3, pp. 333-347.

Schmenner, R.W. (1986), “How can service businesses survive and prosper?”, *Sloan Management Review*, Vol. 28 No. 3, pp. 21-32.

Schultz, K.L., Juran, D.C., Boudreau, J.W., McClain, J.O. and Thomas, L.J. (1998), “Modeling and worker motivation in JIT production systems”, *Management Science*, Vol. 44 No. 12, pp. 1595–1607.

Schultz, K.L., McClain, J.O. and Thomas, L.J. (2003). “Overcoming the dark side of worker flexibility”, *Journal of Operations Management*, Vol. 21 No. 1, pp. 81-92.

Secchi, E. and Roth, A.V. (2018). “The impact of service improvisation competence on customer satisfaction: evidence from the hospitality industry”, *Production and Operations Management*, forthcoming.

Shah, R., Goldstein, S.M., Unger, B.T. and Henry, T.D. (2008), “Explaining anomalous high performance in a health care supply chain”, *Decision Sciences*, Vol. 39 No. 4, pp. 759-789.

Shell, M. A. and Buell. R.W. (2017), "Mitigating the negative effects of customer anxiety through access to human contact", working paper, Harvard Business School, Harvard University, 28 June.

Spencer, M. W. (2011), "Pinning: these are a few of my favorite things", *San Antonio Express-News*, 11 August, available at: http://www.mysanantonio.com/life/article/Pinning-These-are-a-few-of-my-favorite-things-1882964.php (accessed 13 October 2017).

Spohrer, J. and Maglio, P.P. (2008), "The emergence of service science: toward systematic service innovations to accelerate co-creation of value", *Production and Operations Management,* Vol. 17 No. 3, pp. 238-46.

Sundararajan, A. (2016), *The Sharing Economy: The End of Employment and the Rise of Crowd Capitalism*, MIT Press, Boston MA.

Sundin, E., Lindahl, M. and Ijomah, W. (2009), “Product design for product/service systems: design experiences form Swedish industry”, *Journal of Manufacturing Technology*, Vol. 20 No. 5, pp. 723-753.

Susskind, R. and Susskind, D. (2015), *The Future of the Professions: How Technology Will Transform the Work of Human Experts*, Oxford University Press, Oxford, UK.

Tax, S.S., McCutcheon, D. and Wilkinson, I.F. (2013), “The service delivery network (SDN): a customer-centric perspective of the customer journey”, *Journal of Service Research*, Vol. 16 No. 4, pp. 454-470.

Thompson, J.D. (1967), *Organizations in Action*, McGraw-Hill, New York, NY.

Underwood, J., Bartolome, A. and Lefrere, P. (2011), “Big issue: the example of learning platforms”, in Carneiro, R., Lefrer, P., Steffens, K. and Underwood, J. (Eds.), *Self-regulated Learning in Technology Enhanced Learning Environments*, Sense Publications, Rotterdam, Netherlands, pp. 1445-154.

van Beuningen, J., de Ruyter, K., Wetzels, M. and Streukens, S. (2008), “Customer self-efficacy in technology-based self-service: assessing between- and within-person differences”, *Journal of Service Research*, Vol. 11 No. 4, pp. 407-428.

van Birgelen, M., Jong, A. and de Ruyter, K. (2006), “Multi-channel service retailing: the effects of channel performance satisfaction on behavioral intentions”, *Journal of Retailing*, Vol. 82 No. 4, pp. 367-377.

Vargo, S.L. and Lusch, R.F. (2008), “Service-dominant logic: continuing the evolution”, *Journal of the Academy of Marketing Science*, Vol. 36 No. 1, pp. 1-10.

Verleye, K., Jaakkola, E., Hodgkinson, I.R., Jun, G.T., Odekerken-Schröder, G. and Quist, J. (2017), "What causes imbalance in complex service networks? Evidence from a public health service", *Journal of Service Management*, Vol. 28 No. 1, pp. 34-56.

Verhoef. P.C., Lemon, K.N., Parasuraman, A., Roggeveen, A., Tsiros, M. and Schlesinger, L.A. (2009), “Customer experience creation: determinant, dynamics and management strategies”, *Journal of Retailing*, Vol. 85 No. 1, pp. 31-41.

Verma, R. and Boyer, K. (2000) “Service classification and management challenges”, *Journal of Business Strategies*, Vol. 17 No. 1, pp. 5-24.

Victorino, L., Field, J.M., Buell, R.W., Dixon, M.J, Goldstein, S.M., Menor, L.J., Pullman, M.E., Roth, A.V., Secchi, E. and Zhang, J.J. (2018), “Service operations: what have we learned?”, working paper.

von Nordenflycht, A. (2010), "What is a professional service firm?: Toward a theory and taxonomy of knowledge-intensive firms", *Academy of Management Review*, Vol. 35 No. 1, pp. 155-174.

Voss, C., Roth, A.V. and Chase, R.B. (2008), "Experience, service operations strategy, and services as destinations: foundations and exploratory investigation", *Production and Operations Management*, Vol. 17 No. 3, pp. 247-266.

Wagner, S., Hoisl, K. and Thoma, G. (2014), "Overcoming localization of knowledge-the role of professional service firms", *Strategic Management Journal*, Vol. 35 No. 11, pp. 1671-1688.

Wallace, D., Giese, J. and Johnson, J. (2004), “Customer retailer loyalty in the context of multiple channel strategies”, *Journal of Retailing*, Vol. 80 No. 4, pp. 249-263.

Waller, M.A. and Fawcett, S.E. (2013), “Data science, predictive analytics, and big data: a revolution that will transform supply chain design and management”, *Journal of Business Logistics*, Vol. 34 No. 2, pp. 77-84.

Wamba, S.F., Akter, S., Edwards, A., Chopin, G. and Gnanzou, D. (2015), “How ‘big data’ can make big impact: findings from a systematic review and a longitudinal case study”, *International Journal of Production Economics*, Vol. 165, p. 234-246.

Wang, C., Harris, J. and Patterson, P.G. (2012), “Customer choice of self-service technology: the roles of situational influences and past experience”, *Journal of Service Management*, Vol. 23 No. 1, pp. 54-78.

Weber, O. (2005), "Sustainability benchmarking of European banks and financial service organizations", *Corporate Social Responsibility and Environmental Management*, Vol. 12 No. 2, pp. 73-87.

Wikström, S. (1996), “The customer as co-producer”, *European Journal of Marketing*, Vol. 30 No. 4, pp. 6-19.

Wunderlich, P., Kranz, J., Totzek, D., Veit, D. and Picot, A. (2012), “The impact of endogenous motivations on adoption of IT-enabled services: the case of transformative services in the energy sector”, *Journal of Service Research*, Vol. 16 No. 3, pp. 356-371.

Xie, C., Bagozzi, R.P. and Troye, S. V. (2008), “Trying to prosume: toward a theory of consumers as co-creators of value”, *Journal of the Academy of Marketing Science*, Vol. 36 No. 1, pp. 109-122.

Xue, M. and Field, J.M. (2008), "Service coproduction with information stickiness and incomplete contracts: implications for consulting services design", *Production and Operations Management*, Vol. 17 No. 3, pp. 357-72.

Zaslavsky, A., Perera, C. and Georgakopoulos, D. (2012), “Sensing as a service and big data”, in *Proceedings of the international conference on advances in cloud computing (ACC)*, Computer Society of India, Bangalore, India, pp. 21-29.

Zeithaml, V.A., Berry, L.L. and Parasuraman, A. (1996), "The behavioral consequences of service quality", *Journal of Marketing*, Vol. 60 No. 2, pp. 31-46.

Zeithaml, V.A., Brown, S.W., Bitner, M.J. and Salas, J. (2014), *Profiting from Services and Solutions: What Product-Centric Firms Need to Know*, Business Expert Press, New York, NY.

Zervas, G. Proserpio, D. and Byers, J.W. (2017), “The rise of the sharing economy: estimating the impact of Airbnb on the hotel industry,” *Journal of Marketing Research*, forthcoming, available at: https://doi.org/10.1509/jmr.15.0204.

Zhang, J.J., Joglekar, N. and Verma, R. (2012), "Pushing the frontier of sustainable service operations management: evidence from US hospitality industry", *Journal of Service Management*, Vol. 23 No. 3, pp. 377-399.

Zhang, W. and Banerji, S. (2017), “Challenges of servitization: a systematic literature review”, *Industrial Marketing Management*, Vol. 65, pp. 217-227.

Zimmerman, E. (2016), “Ride-hailing start-ups compete in “Uber for children niche,” *The New York Times*, 13 April, available at: https://www.nytimes.com/2016/04/14/business/smallbusiness/ride-sharing-start-ups-compete-in-uber-for-children-niche.html (accessed 1 May 2017).

Zomerdijk, L.G. and Voss, C.A. (2010), "Service design for experience-centric services", *Journal of Service Research*, Vol. 13 No. 1, pp. 67-82.

Zorzini, M., Hendry, L.C., Huq, F.A. and Stevenson, M. (2015), "Socially responsible sourcing: reviewing the literature and its use of theory", *International Journal of Operations and Production Management*, Vol. 35 No. 1, pp. 60-109.

Appendix A: Generic sharing economy transaction types and illustrative examples*

Generic Types	Illustrative Examples and Commentary
Nonmonetary Transfers	
Gifting	***Gifting*** has many variants of platforms (Patel, 2014). For example, **Wrapp** enables friends to contribute to gifts. **Dwolla** enables online funds transfers for friends and fami connections through Facebook and LinkedIn or directly through Twitter. **Fastacash** gives peers the opportunity to gift money, airtime, coupons, tokens, along with messages, vide and file transfer information. **Jifti** allows the purchaser to scan and buy an item at the retail site; the recipient then goes to the retailer to pick it up or select an alternative, ar other gifters can chip in. **Copius** is a social marketplace akin to eBay, but gifters post items in their home or closet that they no longer want and their friends can take for fre **GiveForward** enables friends and family to begin fundraising money directly for a loved one within minutes of when they need it—at no charge.
Volunteering	***Volunteering*** networks are formed from grassroots movements and groups of people are giving assets free for a cause (e.g. time or goods). For example, **The Freecycle Netwo** (TFN), an Arizona registered charity, is a web-based, national cooperative that is built around sustainability principles. It is comprised of 5,301 groups (e.g. volunteers who suppo the service process locally, including picking up and delivering the free goods) and has 9,155,712 individual members, who are giving and receiving items for free in their ow towns and neighborhood. **TrashNothing** ties the Freecycle community to mobile users. Interestingly, some current sharing economy platforms are extending services towar assistance in crisis relief efforts. For example, **Nextdoor**, a neighborhood social networking site, has plans to partner with local emergency response organizations and cities ar will enable the sharing of preparedness and alert messages associated with emergencies. Moreover, the platform enables neighbors to share skills and resources they hav available, as well as special needs during an emergency. **TaskRabbit Needs for First Responders** platform links authorized first responders with its entire community of 30,00 taskers, who can safely volunteer their services. Importantly, Taskers are fully vetted with background checks. **Airbnb** engineered its platform during Hurricane Sandy to allo hosts to open their homes voluntarily to people in need due to the flood. Other types of volunteer exchanges are **Wikipedia**, hosted by the **Wikimedia** Foundation, which is platform where people give their time to share, update, and check the accuracy of content; and **Patient Innovation**, a platform created for patients to share and access helpf solutions to cope with their diseases.
Swapping	***Swapping*** platforms enable the bartering and trading of goods and services among peers, without any monetary exchange. Bartering is a time old way of exchanging goods ar services; and today's platforms have evolved to facilitate the process and make it easier. For example, **Listia**, one of the leading exchange marketplaces, uses a system of credi and auctioning to acquire goods from its virtual inventory of over 100,000 items; its socially inviting "fun" platform encourages people to give and get new items for fre **BarterOnly** encourages providers to not only trade one item but also bundle multiple items together in order to receive an item of equal value or more; then the item received ca be bundled again with other items to trade up to an item with even more value. **Yerdle** has no seller fees for posting and the seller pays shipping; however, the payment is Yerdle credits to purchase other products on the platform. **Tradeschool** teachers trade their knowledge and skills in exchange for others' knowledge and skills or material good with no money changing hands. Other types of swapping platforms include **Fon**, **SwapTrade**, and **Vinted**.
Monetary Transfers	
Financial Services	***Financial services*** platforms sidestep big financial institutions. Comparatively, customers usually get better rates, flexible terms, and/or convenience for personal loans, digit wallets and insurance. These platforms match qualified lenders/investors with customers based on their credit risk tolerance or fit with the providers' investment portfolio need **Zopa**, in the U.K., is a pioneer in this space and launched in 2005. Other prominent platforms are **Lendingtree**, **Prosper**, **Upstart** and **Funding Circle**, which are deemed the best f "investors" (Garret, 2017). **SoFi's** lending platform is particularly intriguing because of the extended array of services it offers, especially for refinancing student loans. It provid free coaching assistance with a student career strategy (e.g. helping with placement and negotiating salaries), as well as wealth advise and unemployment protection. Using digit wallets (e.g. **Venmo** and **Square Cash)**, users can send payments instantly to friends and cash out to their banks. **Transferwire** is a foreign exchange app. Sharing econom insurance lets insured individuals pool their capital within some self-organizing and self-administering group. The first such insurance models arose in Europe (e.g. **Friendsuran** in Germany and **Guevara** in the U.K.) and China (e.g. **TongluBao**), whereas **Lemonade** was the first to enter the U.S. It is a fully licensed insurance carrier for property and casual that entered New York in 2015, then Illinois, and most recently, California (Sawers, 2017).
Renting	***Renting*** transactions types span both human and physical assets, where usage has a temporal component and captures the asset's idle capacity. Among the most well known sharing of physical assets are **AirBnb, Uber** and **Lyft**. Each has international exposure and extended service lines. Nevertheless, competition in these spaces exists. In th transportation space, there are platforms such as **Curb** which connects riders with professional, insured and fully licensed taxi and other drivers for hire and allows advance bookings. **Turo** (formerly RelayRides) affords private car owners the opportunity to lease their own personal vehicles, now with a focus on longer-term rentals of more than a da (versus hourly). **Blablacar** is a ridesharing service that connects riders with drivers with empty seats. It is now experimenting with a carpooling app for commuters. **Postmates** is a

on-demand local courier service that moves goods from local stores or restaurants to users. **Spinlister,** a premier bike rental and other sharing services (e.g. surfboards, SU snowboard or skis), connects owners with racers, travelers and enthusiasts globally. **Liquid** connects neighbors for bike sharing rentals. In the home sharing space, some **Airbr** competitors are **HomeAway**, **Flipkey**, **HouseTrip**, **VacayHero**, and **Wimdu**. In the tangible asset rental space, there are platforms like **Breather** which provides full-day or multi-da offsite meeting or individual work spaces. **WeWork** offers shared office workspaces and office services for entrepreneurs, freelancers, and small businesses. **Zilok** has daily renta of almost everything from tools to luxury automobiles and homes. **Kitsplit** has photographers and videographers leasing high end/rare cameras, high tech equipment, and spac from creatives and small production studios. **Rentez-Vous**, which envisions itself as the Airbnb of fashion, is a platform where people can rent out their clothes, access-oth people's wardrobes, and meet like-minded individuals. **UsedCarboardBoxes** is a distribution market where boxes reused from large firms are resold to movers. Labor mark platform examples include services such as **TaskRabbit** who assists customers with everyday tasks by matching them with local freelance labor). **Thumbtack** matches local servic professionals (e.g. web-design, home, wellness.) with customers. **Instacart** picks up and delivers same day groceries from local retailers using personal shoppers. **Amazon Tu** matches "requesters" (e.g. individual and business receivers) with "workers" (i.e., service providers) who select the online jobs/tasks that they are willing to complete.

Retailing

Retailing e-services in many ways helped shape other sharing economy marketplaces, with pre-owned goods and bespoke goods that are altered to individuals' tastes or usag **Ebay** and **Craigslist** are among the earliest platforms for auctioning used goods, and later for selling directly to customers. **Etsy** retails a wide variety of handmade or vintage iten (e.g. clothing and accessories; home and living items, wedding souvenirs and keepsakes; jewelry; craft supplies and tools). **Neighborgoods** sells foodie-themed, one-off har printed gifts (e.g. dish towels, prints, buttons). **Grommet Wholesale** matches makes of products with small business retailers. With parents' approval, **KidsTrade** lets children bu sell or trade toys, games, and clothing on mobile devices with classmates and verified friends. **Poshmark** targets millennial women as the go-to social marketplace for used fashic items, with "mall brands" and mid-ranged pricing. **Tradesy** targets a higher-end customer segment than Poshmark (i.e., mid- to high-end, pre-owned designer products **WeddingRecycle** sells previously owned bridal party clothing and wedding decorations and accessories and offers a concierge service to link brides and grooms to other vendors.

Mix of Transfer Types

Sharing/Collaborating

Sharing/Collaborating enabling platforms have evolved rapidly in almost all industrial sectors, as a venue for document sharing, idea generation, enhancing innovation throug collaboration, sharing assets, and more. Besides sharing of ideas and expertise among peers, these technologies are now enabling independent professionals to join together ar collaborate among their practice communities. For example, **Pinterest** is a "virtual pin board" or visual catalogue of pictorially rich ideas and "how to tips" that can be share among friends (Spencer, 2011). **Hometalk** is a do-it-yourself project forum where peers share and post "how to" details for simple home projects. **Dropbox** is a general file sharir service; in 2010, **Dropbox Dribble** built a community of and for independent designers to share screen shots of their own work among themselves and for sharing posts of jc openings for designers. **Slack** provides virtual space for communications, collaboration, creation and co-operation at a digital workplace. ***Quirky*** matches individuals' new idea with talented experts on an invention platform who render help in bringing the idea to market. **Couchsurfing** peers are able to share other peers' couches without any moneta exchanges.

Talent/Learning

Talent/Learning encompasses platforms that offer peers ways to gain knowledge. For example, **P2PU** is a nonprofit online open learning community. P2PU learning circle users ca organize their own study groups to learn about different topics and professional staff facilitation and monitoring occurs. **Popexpert** connects face-to-face experts in various "Lif Work, and Play" categories with users wanting personal development. **CreativeLive** broadcasts live classes with in-studio students, usually ranging from 3-15 people, to act a proxies for students at home. **Skillshare** links users with real world classes taught by expert professionals and much of the pedagogy focuses on interaction. It is distinctive in th anyone can create a course. Moreover, future such learning is posited to be enhanced by "personalized learning platforms" (PLE). PLEs are user-configurable, dynamical changeable amalgams of P2P learning (Underwood *et al.*, 2011, p. 147).

Entertaining

Entertaining platforms serve as a marketplace of shared experiences (e.g. food platforms that do not serve food but rather a culinary experiences) and are the next wave entertainment. For example, **VizEat** matches guests with local hosts providing home-cooked meals anywhere in the world. It is called the "Airbnb of delicious food" (Knowle 2017). **MealSharing** matches users with hosts by viewing a visual catalog of menu items, location, and dates/times to meet. Group capacity is limited to "available spots." **Cookap** connects people who love to eat with those who love to cook for shared food experiences. **Vayable** offers unique travel experiences by linking travelers with their own person tour guides. **BitTorrent** is a file-sharing protocol that enables people to share digital video files, including TV shows, video clips, and digital audio (Paul 2016). **Google Play** offe game services that enable multiplayer game sessions and allows gamers to transfer messages to each other. **Fitbit** and **Peloton** are digitally-enhanced fitness products that off sharing of exercise experiences among family and friends. **Pley** is a toy rental business that aims at entertaining children with "a monthly box of activities, stories and goodies th [purports to make] kids (…and their parents) happy."

*information on any example not otherwise cited can be found by visiting the organization's website