Emerald Supply Chain Management: An International Journal

Managing Reverse Exchanges in Service Supply Chains

Journal:	*Supply Chain Management: an International Journal*
Manuscript ID	SCM-12-2015-0467
Manuscript Type:	Original Manuscript
Keywords:	Service supply chain, Reverse logistics, Service System, Closed Loop Supply Chains

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Abstract

Purpose

This study aims to address the management of reverse flows in the context of service supply chains. The study builds on the characteristics of services production reported in literature to: identify diverse types of reverse flows in services supply chains; discuss key issues associated to the management of reverse service flows; and suggest directions for research for developing the knowledge for management of reverse flows in service contexts.

Design/Methodology/Approach

This study first provides an overview of the theoretical background which supports the identification and the characterization of the flows, and the reverse flows, involved in service production. A short summary of each paper accepted in this special issue is also provided to give readers an overview of the various issues around reverse exchanges in service supply chains that authors have attempted to address.

Findings

In this study we identify distinct types of reverse flows in services production building on the analysis of the characteristics of service production and delivery reported in the literature. Our discussion highlights the fact that service supply chains can be quite diverse in the type of exchanges of inputs and outputs that take place between customers and providers, showing that often there can be substantial flows of items to return. In particular, and differently from manufacturing contexts, we highlight that in service supply chains providers might need to handle bi-directional reverse flows.

Research limitations/implications

The lack of research on reverse service supply chains is to a great extent a consequence of dominant paradigms which often identify the absence of physical product flows as a key distinguishing feature of service supply chains, and therefore lead to the misbelief that in services there is nothing to return. This special issue therefore aims to clarify this misunderstanding through the limited selection of eight papers that address various issues around reverse exchanges in service supply chains.

Originality/value

While theoretical and empirical research in supply chain is abundant, management of reverse exchanges in service supply chain is sparse. In this special issue we aim to provide a first contribution to understand how the characteristics of service production raise new issues for the management of reverse flows in service supply chains, and to foster the development of adequate management strategies.

1. Introduction

Globalised businesses and their complex supply chains face new challenges for the management of production flows and exchanges between customers and service providers. The management of reverse exchanges is particularly important for costs reduction and enhanced sales performance, thereby positively affecting the profit margin of an organisation (Jayaraman, 2007; Xie and Breen, 2012). Reverse supply chain management has been widely recognised as a strategic operational competence in manufacturing (Fleischmann et al., 2005) as it aims to provide managers with efficient approaches for recovering value from returned items (e.g. through the recovery or the re-use of selected product modules or parts). Its objectives have, however, expanded largely beyond cost minimisation issues. Today the field is also driven by the need to provide answers to environmental concerns associated to the flow of production items between customers and providers (Fine-man, 1997; Van Hoek 1999; Ritchie et al. 2000; Xie and Breen, 2012). An ability to effectively address customer returns can dramatically improve customer satisfaction and loyalty, thus providing key opportunities for creating value (Blackburn et al. 2004; Mollenkopf et al. 2011).

While theoretical and empirical research in supply chain is abundant, management of reverse exchanges in service supply chain is sparse (Ho et al. 2002; Giannakis, 2011). This research gap is to a great extent a consequence of dominant paradigms which often identify the absence of physical product flows as a key distinguishing feature of service supply chains, and therefore lead to the misbelief that in services there is nothing to return (Ellram et al. 2004). Operations management literature, conceptualises services as bi-directional chains involving exchanges between the customer and the provider (Stuart 1997; Sampson and Spring 2012), specifically highlighting the existence of substantial exchanges of customer inputs into the productive system, e.g. information, materials, etc. (Lovelock 1983; Sampson and Froehle 2006). Service productive systems need to handle several types of reverse exchanges for example, when a given service provision relationship needs to be terminated or interrupted, providers might need to get customers to return some facilitating goods, i.e., any materials or items used to support the delivery operations such as credit and debit cards in banking services, and equipment in telecommunication (Roth and Menor 2003). Termination also requires providers to handle exchanges which need to be returned from the provider to the customer. These provider-customer exchanges raise new challenges which are driven by some specific characteristics of service production. The failure to return customer items as they originally entered the service productive system after the input has been processed can significantly impact customer satisfaction and loyalty. Moreover, the service providers' resources already utilised for the terminated service provision cannot be re-used for the next customer. This often limits the ability to recover the providers' productive resources and to re-use them in a new service.

This special issue therefore aims to address the management of reverse flows in the context of service supply chains. We therefore first provide an overview of the theoretical background which supports the identification and the characterization of the flows, and the reverse flows, involved in service production. We build on the characteristics of services production reported in literature to: identify diverse types of reverse flows in services supply chains; discuss key issues associated to the management of reverse service flows; and suggest directions for research for

developing the knowledge for management of reverse flows in service contexts. A short summary of each paper accepted in this special issue is also provided to give readers an overview of the various issues that authors have attempted to address.

2. Supply chain management: flows and reverse flows

Supply chain management concerns the coordination and integration of the processes and activities performed by the organizations in the chain, for the pursuit of objectives of efficiency and value creation (Cooper et al., 1997; Kumar et al. 2013). The purpose is to improve the overall supply chain competitiveness, by integrating all productive activities into a seamless process, and by addressing the network of organizations as whole system (Lummus and Vokurka, 1999). According to the definition advanced by the Council of Supply Management Professionals supply chain management can be seen as a function which "integrates supply and demand within and across companies" (CSCMP, www:\\http:cscmp.org, 2011). Such "integrating" purpose called for the development of multidisciplinary knowledge and has driven contributions from a number of fields such as operations, marketing and organizational theory (Chen and Paulraj, 2004). For example, supply chain research has shown that sharing information about demand and inventory across the organizations can provide substantial cost reductions (e.g. inventory holding costs) (Cachon and Fisher, 2000). However other contributions highlighted the importance of adapting the offer to customer needs and have developed modular approaches to adjust to link efficiency and customer satisfaction (Heikkilä, 2002).

The scope of supply chain management research and practice has evolved to consider both forward and reverse flows in the chain. Reverse supply chain often termed as 'reverse logistics', was earlier known as 'reverse distribution' which referred to the retro-movement of outdated or damaged products and later also included retromovement of end-of-life products for recycling. The management of customer returns requires the setup of efficient reverse logistics strategies to support the timely reprocessing and/or re-use of the returned items (French and LaForge, 2006). Guide and Wassenhove (2002) described reverse supply chain as 'the series of activities required to retrieve a used product from a customer and either dispose of it or reuse it' whereas Dowlatshahi (2000) define it as a manufacturing entity that retrieves previously shipped parts and products from the point of consumption to the manufacturing entity for possible recycling, remanufacturing, or disposal.

Unlike forward supply chains, design strategies for reverse supply chains remained relatively unexplored and underdeveloped (Blackburn et al., 2004; Kim and Lee, 2015), until its implications for customer satisfaction were fully acknowledged. The management of returned items is now perceived as an opportunity to improve customer service perceptions and loyalty. Moreover, as law, government agencies and consumer pressures increasingly force companies to implement environment friendly principles in their daily practice (e.g. changing packaging regulations, environmental concerns for the re-utilization and recycling of residual and final products), the businesses strategic thinking move beyond the traditional focus on the flow of goods/materials from supplier to customer end, to accommodate the post-sale customer services such as customer service, service logistics, recycling and refurbishment, etc. Other

factors that contributed to the development of the concept of reverse supply chain include: shortened product life cycles; the drive to reduce costs; increase in e-commerce sales; increased demand for repairs, re-manufacturing, upgrades, or re-calibration; potentially valuable products that are no longer viewed as such by the current user; product recalls; and rental and warranty returns (Guide and Wassenhove, 2002).

The closed loop supply chain concept also evolved from the reverse flows that refer to a complete loop of flows from the customer, back to the provider, then through reprocessing operations and then back to the customer. Hence, it involves a manufacturer/buyer, taking responsibility directly for the reverse logistics process (Blumberg, 2005). Recently, reverse flows have prompted manufacturers to seek ways to increase value of return products. As de Brito and Dekker (2002) point out, reverse logistics concentrates on those streams where there is some value to be recovered and the outcomes enter a new supply chain. Guide and Van Wassenhove (2002) also stated that the product returns and their reverse supply chains represent an opportunity to create a value stream.

Reverse supply chain flows can therefore occur for very diverse reasons. de Brito and Dekker (2003) identified three driving forces behind the reverse flows, namely: (i) Economics, i.e. this driving force relates to all recovery actions that provides direct or indirect benefits to companies, (ii) Legislation, i.e. any jurisdiction which indicates that companies should recover its product or accept them back and, (iii) Extended Responsibility, concerning a set of values or principles that forces companies to become socially engaged with reverse supply chain. Likewise, Fleischman et al. (2001) identified flows in five broad categories associated with return flows: (i) End-of life returns; (ii) Commercial returns; (iii) Warranty returns, i.e. failed products submitted for repair; (iv) Production scrap and by-products and (v) Reusable packaging material. Overall Fleischman et al. (2001) argued that the growth in the reverse supply chain can be broadly divided into two categories; return agreements for excess products and extended producer responsibilities. Thus, the first category refers to the customers right to return purchased products and be refunded and the second category refers to used products i.e. companies are responsible for the entire life cycle of the products.

Much of the work on the reverse flow in the supply chain has been concerned with the logistics/transportation of the products. Guide and Van Wassenhove (2002) list five key components to the reverse supply chain, namely; Product Acquisition; Reverse Logistics; Inspection and Disposition; Reconditioning; and Distribution and sales. Thus, when a customer returns products to the reseller, it is transported to returns evaluation location for credit issuance and product disposition, whereby they are inspected to determine how most value could be recovered from this product. Inspection also determines if remanufacturing of the return product is viable and valuable option, waste product is then sent for recycling/scraps and remanufactured product is sold to generate additional revenue. Blackburn et al. (2004) suggest the five following principles to successfully manage and extract value from product returns: (i) Treat Returns as Perishable Assets, (ii) Elevate the Priority of the Returns Process, (iii) Make Time the Essential Performance Metric, (iv) Use Time Value to Design the Right Reverse Supply Chain, (v) Use Technology to Achieve Speed at Lower Cost.

3. Supply chain management in service contexts

In the services domain, the approaches for managing supply chain actors, and their interrelationships, have remained less formalized. This lack of analytical approaches for service supply chains has been attributed, to some extent to the diversity of service production systems and outputs, which make them hard to capture with one single framework (Baltacioglu et al. 2007). Whereas in manufacturing supply chains companies are linked by a common flow of goods that are being processed towards reaching the end customers, in services the delivery outputs can be very diverse, e.g. from physical outputs in repairs services, to intellectual in education or experiential in motion pictures (Goodman and Steadman, 2002).

In recent years some frameworks for addressing service supply chains have been proposed, building on the existing manufacturing approaches. Ellram et al. (2004) developed a translation of supply chain management approaches, from manufacturing, to the context of professional services. Highlighting the absence of products flows in the delivery of professional services, the authors defined supply chain management, as the "the management of information, processes, capacity, service performance and funds from the earliest supplier to the ultimate customer" (Ellram et al., 2004, pp.25). Following the process approach suggested in manufacturing literature the authors identified five key processes and flows that cut across a services supply chain: information flows, capacity and skills management, demand management, supplier relationship management and service delivery management. Although this work provided some support regarding the applicability of a process view and of a supply approach to the context of services production, it reinforced the need to develop service specific approaches, which can adequately address the service production activities and process flows. Other authors have contributed to the discussion about the transferability of supply chain frameworks to the context of service, highlighting other important differences, notably the active role of customers in service production systems, which creates the need to consider bi-directional production flows between customers and producers (Maull et al. 2012, Sampson, 2000). Service supply chains are therefore depicted as more complex to formalize, due both to the more diverse nature of flows involved in the production and delivery.

4. Flows and reverse flows in service supply chains

Some of the fundamental characteristics that have been highlighted in service production provide important insights to understand the flows and reverse flows that service supply chains need to handle.

A key distinguishing characteristic of services concerns the presence of customer inputs in service production processes, as described in the work on customer-supplier duality by Sampson and Spring (2012) and Sampson and Froehle (2006). Services are conceptualized as processes which act primarily on inputs which are provided by the customer, such as the customer's self, his/her belongings or other materials, and information (Sampson and Froehle, 2006, Wemmerlov, 1990). Customers are therefore responsible for the flow of material as well as immaterial items into the production process (e.g. their equipment in the case of repair services, their information in financial services, or their minds and bodies in health and education services). This introduces a fundamental difference in service supply chains,

relatively to what happens in manufacturing contexts, where typically physical goods flow from producers to consumers in a unidirectional way: “With services, customer-supplier duality implies that production flows not only from suppliers to customers, but also from customers to suppliers” (Sampson, 2000, pp.353). Service supply chains are therefore characterized by bi-directional exchanges between the customer and the provider, involving flows of inputs (e.g. information, material items, etc.) and outputs (e.g. repaired items, experiences, information, etc.) which are of very diverse nature. A direct consequence of the presence of customer inputs in service processes, in the occurrence of, for example, some interruption during a service delivery process will be the need to assure the returns of customer items back to them in adequate conditions. Likewise, in case of failure in delivering the final output/process results that were requested by the customers, providers might need to re-access to the customer items, i.e. inflow them back into the production system, to proceed to the necessary modifications i.e. re-work. In many of such situations, the management concerns regarding such reverse flows, will be driven by the importance of assuring a fast and efficient response, and return of the items, so that they can be reprocessed with minor losses in customer value and resources utilization. However, some specific concerns might emerge when dealing with customer items. For example, in the case of the termination of financial or telecoms services (which involve as key input customers’ information), providers’ might need to ensure an adequate procedures for the disposal of customer personal information (e.g. personal details, transactions, etc.). Moreover, such need to handle the disposal of end of-service customer items, can occur both in the case of an interruption or a failure in service provision as well as in regular, well succeeded service delivery (i.e. it is often requested by the customer). The same concerns apply for services dealing with customer material items (e.g. repair services) for example, in situations when providers proceed to the replacement of some component of the customer equipment, and need to provide an adequate end to the old damaged component.

Service processes often involve other flows of material items, which have a supporting role in the production and delivery operations, i.e. service facilitating goods as defined by Roth and Menor (2003, pp.149): “the materials, supplies and merchandise that are used or consumed in service delivery process”. Examples of facilitating goods include credit and debit cards in financial services, mobile phones and other equipment in telecoms, sports material such as golf clubs, ski equipment in leisure services, etc. Again, supply chain processes need to support the return of some of these items back to the provider in the end of a service encounter or at the end of a relationship in the case of continuous service provision supported by some form of contract. The concern with the need to ensure a timely return of the items is also present in this case. Moreover, often, providers have the added concerns of assuring in that the items are returned in adequate condition so that they can be reused by other customers in their turn.

A second characteristic of service production which bears important implications to the management of reverse flows in services derives from the nature of service outputs that are delivered and assessed by customers. Whereas in manufacturing processes the result is typically a physical product whose quality can be measured quite objectively, the results obtained in many services can involve intangible components, which are more difficult to specify and assess (Lovelock and Wirtz, 2001; Grönroos and Ojasalo, 2004). Service processes are, to a great extent, visible to customers, whom often have an active participation by engaging in

service production activities. Consequently customers don't evaluate only the final "result" of the process, but also how the service was delivered and how good their personal experience was (Grönroos and Ojasalo, 2004; Svensson, 2003). The particular nature of the outputs delivered to customers is also reflected in the literature which refers to the simultaneity of production and consumption in services (Edvardsson et al. 2005).

The immersion of customers in the service supply chain processes, makes it possible, for example, for service failures to be detected by customers long before the service delivery is completed. Likewise, customers can decide to end a service provision relationship for some other reason (e.g. a change in customer needs or requirements for the service) during the production of the services. This implies that, unlike in manufacturing contexts, in service supply chains the need to manage reverse flows can emerge before the delivery of the final production outputs. This suggests that any procedures that providers might need to setup to manage the returns of customer items, are likely to be distinct, depending on the process phase when the return occurs. The latter in the service process, the higher will be the extent of transformation/processing done on the customer provided inputs. Consequently the more complex it will be to bring customer items back to their original status (if required by the customer), and the higher will be the amount of providers' resources already used in service production that are likely not to be able to be recovered and/or re-used. Consider for example the case of a repair service in which some service failure occurs during the service process.

In such circumstances, the customer might decide to end service relation with the provider, and look for an alternative that he trusts to be more able to meet its requirements. In some cases it might not be possible for the provider to bring the customer item back to its original state, i.e. the state before the repair operations already conducted took place. The resources (e.g. labor, time, materials etc.) used in the repair operations are also often impossible to recover and reuse. The costs associated with service failure have been extensively examined in service recovery literature (see for example Colgate and Norris, 2001). However, the aspects explored are essentially related to the potential losses in value due to the implications for customer loyalty and word of mouth. Operational aspects related to the resources invested in interrupted service processes remain unaddressed. The analysis of the customer and provider flows associated to the resolution of service failures suggests that there might be some important opportunities for improvement in the management of service supply chains. Our analysis suggests, for example, that the inclusion of customer feedback or process control practices in earlier phases of service delivery might be beneficial, for they can lead to an earlier detection of failures, and improved opportunities for recovering of customer inputs and production resources.

A third final characteristic of service supply chains, which is relevant for the management of reverse flows, is related to the fragmentation of service processes across different actors. Often, different supply chain partners are directly involved in service process operations, notably in dealing with customer inputs and interaction directly with the customer. This importance of this characteristic in service delivery contexts has been recently highlighted Wynstra et al. (2015) who refer to "service triads" as an emerging business model, i.e. the setting where a buyer contracts with a supplier to deliver services directly to the buyer's customer. Health services are good examples of such service supply chains, as illustrated in the work of Lillrank et al. (2011)

or Aronsson et al (20011). In such services customers interact with a main healthcare provider, providing their inputs (i.e. information, the customer himself), but often also have to use the services of providers of complementary exams (e.g. blood tests, tissue analysis, etc.) whose outputs are then necessary for the main health service process execution. In some cases customers establish enduring relationships with such complementary service providers, who become partners in service delivery. Other authors have addressed the particular challenges raised by such fragmentation of service across different actors and highlighted as an area of particular concern for service management (van der Valk and van Iwaarden, 2011, Van der Valk et al. 2009, Sako, 2006). In what concerns the management of reverse flows, the fragmentation of service delivery processes across different actors, implies a need for the implementation of coordination and integration mechanisms which enable a seamless and timely flow of returning items. Moreover, it might also require providers to place particular attention to the specification or responsibilities for the management of such reverse across the distinct actors.

5. Introduction to Special Issue Papers

The call for papers for this special issue attracted overwhelming responses – we received over 20 submissions, let alone late submissions that we could not accommodate. Most submissions were from the UK and others from the South Asian region. The guest editors had to be very selective as many of them were high quality submissions. However, after two to three rounds of reviews eventually 8 high quality papers were accepted for this special issue. A quick overview of each accepted paper is presented below.

A study by He et al. (2015) highlights our limited understandings on the nature of reverse supply chains in service sector. Recognizing the heterogeneity of services, their study attempts to clarify the characteristics of forward and the corresponding reverse supply chains in different service sectors. Authors develop a typology of forward and reverse service supply chain based on the degree of input standardization and the degree of output tangibility critical to the design of supply chain. The four typologies presented provide a parsimonious framework for describing complex forward and reverse service supply chains and offering an explanation of their key design characteristics. The main contribution of the paper is to refocus the field into its proper task, hence, aiding theory building and guiding practical developments. The paper can help future researchers to better focus their research effort and managers to design more effective forward and reverse service supply chains, and refine business models to help extend reverse/closed–loop activities.

Yuan et al. (2015) highlight that the majority of current research on reverse logistics (RL) tends to focus only from the perspectives of the suppliers or from the operational approaches aimed at managing an effective supply chain. Recently however demand management as a key strategy for upgrading the reverse logistics service, has become an increasingly important force in companies in order to satisfy consumer demands for exchange. This study proposed and tested a model that examined consumers' intentions to exchange used electronic products, an important element of reverse logistics activity. Based on Value-Belief-Norm (VBN) theory, findings show that consumers' electronic product exchange (EPE) intention can be traced back to a chain of causes: pro-environmental values, awareness of consequence, the individual's

responsibility, and personal norms. The results further contribute to the current literature by demonstrating that the attitude-intention gap is moderated by consumer knowledge and neutralization. This research offers insights to managers to re-evaluating their RL strategies by incorporating customer service management.

A study of the reverse exchanges in healthcare sector is discussed by Xie et al. (2015). Through case study analysis and comparison their work aims to investigate the scale and use of Information Communication Technology (ICT) in managing medical devices in the National Health Service (NHS), with a focus on Reverse Exchange (RE) systems. The sophistication of ICT implementation increases with the risks and value associated with medical devices. A set of operational attributes are derived from ICT implementations which can positively impact on RE performance. Drivers on the adoption of ICT in the NHS include pressure from government, business partners and patients, competitive pressure, perceived benefits, organisation size, top management support and the availability of sufficient resources. Obstacles are mainly centred around the lack of sufficient resource. This research has provided a structure and basis for further research on the application of ICT in RE systems in general. NHS Trusts may use the operational attributes to benchmark their ICT implementation for device management. The actual and potential benefits of ICT implementation could inform technology development and encourage the uptake of ICT in healthcare. Governmental bodies can utilise this information to develop directives to drive ICT adoption in device management and the associated RE system.

Related to integrated healthcare system the paper by Esain et al. (2015) proposes a classification of reverse exchange (RE) that provides an opportunity for managers and researchers to exploit or improve the reverse supply chain flow in highly complex UK healthcare system. The paper draws upon institutional theory, specifically normative and coercive pressures that often get heightened by political sensitive nature of healthcare in the UK. This paper offers a new lens of ‘acted upon’ to evaluate service supply chain processes. Moving beyond traditional classification of volume/variety in product flow supply chain, the researchers argue to expand the frame of utility and value to reflect the specific inseparable nature of service supply chain.

Parry et al. (2015) examines how the internet of things (IoTs) can be employed to give visibility to the use of objects within the context of the home. Visibility refers to a firm’s ability to access data which allows them to ‘see’ what happens in their supply chains; a research area underdeveloped in the domestic context. They provide a categorisation of consumer use data named use visibility measures [UVMs]. Based upon analysis of resource this study proposes four categories of UVMs that address the main dimensions of consumers’ use of resources in context: depletion, consumption, interaction, and experience. The study empirically demonstrates the categorisation in an example case study which captures consumer’s context and rates of use of resource in the home, giving understanding of consumption processes and patterns. Context-specific information about domestic use process gives visibility of previously hidden activity of actual consumption and waste, useful data for forward and reverse supply chain activities.

A symbiotic relationship between household recycling behaviour and municipality household waste recycling systems is investigated in the work of A Jalil et al. (2015). Their study highlights that households or consumers are considered the important pivot point between usual logistics and supply chain flows, e.g. point-of-origin to point-of-consumption, and reverse logistics flows. Thus, their attitudes towards various recycling systems will influence their recycling behaviour. This empirical study developed underlying attributes for both household recycling behaviour and household waste recycling systems and found evidence of a symbiotic relationship where reverse logistics exchanges between households and the municipality were strongly influenced by two critical factors: waste recycling situations and household personal attitude.

Traditional view of the reverse supply chain is predicated on two dominant end purposes for returned goods: reconditioning (high-value recovery) or recycling (low to no-value recovery). This works for manufacturing industry but it is less feasible in the case of reverse service supply chain simply because service is a bundle of tangible and intangible. On the other hand part of service sector, for example, retail lends itself to reverse supply chain resulting in alternative business models. Beh et al. (2015) in their study demonstrate this alternative conceptualisation of reverse service supply chain. The resulting business models not only reduce waste but also help to democratize conception yielding both environmental and social responsibility.

The organizations knowing the art of effective service recovery have greater insight into making their service supply chain more profitable. However, limited understanding of the dimensions of service recovery may also result in customer dissatisfaction and loss in sales revenue. Therefore Kumar and Kumar (2015) aim to evaluate the interrelationship between three dimensions of service recovery - process, employee, and customer, through justice theory lens in financial services call centre in the UK. Their study helps in understanding the relationship of process and employee recovery with customer recovery. The mixed method data collection facilitated in identifying gaps in case company's internal operations and employee's skill-sets that was affecting the complaint management process. Researchers identified factors such as training, operating systems, empowerment, incentives, and feedback as critical in controlling complaints and providing effective recovery. In congruence with literature, the study also confirmed that process optimisation will lead to more satisfied customers and provide opportunity to learn from failure.

6. Conclusions

In this editorial we identify distinct types of reverse flows in services production building on the analysis of the characteristics of service production and delivery reported in the literature. Our discussion highlights the fact that service supply chains can be quite diverse in the type of exchanges of inputs and outputs that take place between customers and providers (e.g. in health, financial services, etc.), showing that often there can be substantial flows of items to return. In particular, and differently from manufacturing contexts, we highlight that in service supply chains providers might need to handle bi-directional reverse flows: i) flows of customer-provided inputs, back to the customer in case of interruption of a service provision, or in some cases, back to the provider for re-processing when the final output failed to meet the customer

requirements; ii) flows of provider items, e.g. facilitating goods, which are trusted to the customer during service delivery to support process operations.

The understanding of the customer and provider items that flow in service production processes suggests that there are some specific issues raised in the management of reverse flows in service contexts. A first consequence of the bi-directional nature of service processes and supply chains, it the fact that providers not only need to handle reverse flows in case of service failures, but often also when the service is correctly delivered. This situation occurs, for example when providers need to get back from customers any facilitating goods used in the service (e.g. communications equipment, sports materials, etc.). A second consequence is derived from the immersion of customers in the service production processes, due to their often active participation. As result from this, and unlike in manufacturing contexts, in service supply chains the need to manage reverse flows can emerge before the delivery of the final production outputs. Consequently, providers might need to setup different procedures to manage the returns of customer items, according to the process phase when the return occurs. Finally we also discuss how the fragmentation of service processes across different actors, which often occurs in service delivery, requires providers to consider the implementation of coordination and integration mechanisms to ensure the effective and timely flow of returning items.

All these aspects represent areas which call for research for improving our understanding of how to manage reverse flows in service contexts. Specifically, we suggest that it would be important conduct empirical investigation to improve our knowledge about: i) the characterization of the flows and reverse flows involved in bidirectional service processes and their illustration across service industries; ii) the determinants of reverse flows in service supply chains, including service failure situations, changes in customer requests, etc. Such understanding of different types of drivers for reverse flows is of particular interest to characterize the characteristics of the flows in each case, and to develop adequate strategies to improve customer value, as well as the utilization (or re-utilization) of providers' resources. In this special issue we aim to provide a first contribution to understand how the characteristics of service production raise new issues for the management of reverse flows in service supply chains, and to foster the development of adequate management strategies.

Acknowledgement

Guest Editors of this Special Issue (SI) would like to express gratitude to all anonymous reviewers for their valuable contributions in reviewing the papers as without their contributions we wouldn't have been able to complete this task successfully. Guest Editors would also like to thank the Editor in Chief, Dr Beverly Wagner as well as the editorial and publishing team for their continuous support. Finally, we would also like to thank all authors who submitted their work for consideration in this special issue. All the submissions were of high quality however, we had to disappoint some contributing authors due to limited publication space. The guest editors have to select the very best out of the best for publication in this SI. We wish all those authors every success in publishing their papers in other outlets.

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