

A systematic literature review on the service supply chain: research agenda and future research directions

Abstract

This paper provides a methodological overview of service supply chain research through a comprehensive review of published literature, enabling us to describe the service supply chain from a knowledge perspective. The nature of the service supply chain is substantially different from the characteristics of the traditional supply chain. Consequently, the robustness of ideas underpinning this area of research has not been fully analysed by the academic community and a more cross-disciplinary approach is needed. Following comprehensive review, all the selected papers can be divided into nine generic groups in terms of problem focus in the service supply chain. These were production processes, human resources, logistics, information technology, theory and model generation, productivity and profitability, environmentally friendly practices, customer satisfaction and other cross-disciplinary studies. Four key aspects of the service supply chain are recommended for future research, namely: environment-friendly practices, market relationships, information technology integration and adoption of industry-specific case studies. In future extensions, additional work can include and correlate knowledge from other disciplines, theoretical perspectives, intellectual trends, and traditional practices associated with service industries. Lastly, this study could be used as a starting point for establishing a future research agenda in the area of the service supply chain.

Keywords: supply chain management; design for service, service supply chain; systematic review, service industries.

1. Introduction

Before the 1980s, separate organisations were responsible for ensuring excellence in product development, operations, logistics, maintaining quality standards and marketing. Due to the quality revolution of the early 1980s, supply chain management was introduced to sustain fierce competition among companies (Oliver and Webber 1982). Over the years, a growing number of companies have realized the importance of integrating management with ongoing process rather than managing them separately and thus have introduced supply chain management as a *discipline* in management (La Londe 1997). As pointed out by Melo, Nickel, and Saldanha-Da-Gama (2009), Supply chain management is “the process of planning, implementing and controlling the operation in an efficient way”.

So far, management literature has largely examined manufacturing supply chains (Beamon 1999). Like the manufacturing sector, service organisations also play an important role in the global economy, contributing 30.4% to 87.2% to gross domestic productivity (GDP) across

countries of both industrialized and emerging economies, as listed on the World Bank website in 2017. However, to date, there has been little comprehensive analysis of the literature on the 'service supply chain' (Ellram, Tate, and Billington 2004; Ellram and Cooper 2014). Given the rapid economic expansion of service activities of global businesses in recent times (Kowalkowski et al. 2015), the service supply chain has become an important topic for debate amongst the key researchers in the operations management area (Wang et al. 2015; Chithambaranathan et al. 2015; Aitken et al. 2015; Holmström and Partanen 2014). However, there is still lack of fundamental research in this area, meaning our understanding of the topic is still rudimentary (Baltacioglu et al. 2007; Boon-itt, Wong, and Wong 2017; Harvey 2016) which is limiting its advancement in terms of quality, process excellence and integration.

Previously, service sector research received less attention because most economies relied largely on advancing industrial and agriculture industries (Robinson and Malhotra 2005; Du et al. 2016; Borodin et al. 2016; Liao, Hu, and Ding 2017). Another reason for its lesser appeal for research was because of the common misconception of directly applying best practice manufacturing supply chain management tools in the service sector to get better outcomes (Ellram, Tate, and Billington 2004). Previous studies mostly focused on the manufacturing and transportation sectors (Baltacioglu et al. 2007; Masali 2016; AL-Shboul 2017; Zhu and Tian 2016; He et al. 2016) but the emergence of the recent boundary less business world has changed this perception. The success of the service sector in US is directed attributed to robust second half economic performance (valued by GDP) to the world's principal economy in 2014 (Guardian 2015). Correspondingly, the major share of GDP of other advanced countries are predominantly due to service industries (Economist Intelligence Unit 2013). The World Development Indicators in 2011 established that the service sector accounted for 71% of total world GDP with a faster growing pace than its manufacturing counterpart (Ru et al. 2012; Rezapour, Allen, and Mistree 2016; Masteika and Čepinskis 2015). Exports in the service industry grew by 11% from 1980 to 2011, an even higher rate than merchandise, and now accounts for US \$4.1 trillion. Developing countries generated 29.82% of this value and 2.85% was from transition economies (World Bank 2016). This development and the inherent difference between manufacturing and service sectors (Ellram, Tate, and Billington 2004; Ellram and Cooper 2014; Scheibe and Blackhurst 2017) justifies new efforts to unpack the challenges and barriers related to the service supply industries (Boon-itt, Wong, and Wong 2017) and find the best supply chain management practices for service organizations. Considering its future potential, only a few studies have tried to integrate service activities in a supply chain framework to increase the intrinsic value of firms (Field and Meile 2008; Sampson and Froehle 2006; Sengupta, Heiser, and Cook 2006; Reimann and Ketchen 2017; Hussain, Khan, and Al-Aomar 2016).

Taking these considerations into account, this paper will review previous scholarly works in the field of service supply chain, to assess the maturity of the discipline and to create a possible agenda for future researchers. To this end, this study primarily reviews existing literature that may be even partially relevant to the way the service supply chain has been conceptualized and applied. In particular, in Section 2, the origin and concept of the service supply chain is provided. The next section illustrates the methodology that was followed in conducting this

systematic review. Section 3 presents the scope of the present study from six major dimensions. The strategy used to search and identify associated papers that were consistent with the service supply chain is described in Section 4. The related literature is then categorized in Section 5. Finally, the paper concludes with an assessment of the current advancement of the service supply chain literature and highlights the significant research gaps to be further investigated by future researchers and practitioners.

2. The conceptualization of supply chain with service elements integration

2.1. The supply chain and supply chain management

Supply chain management, as a formal research topic, is still considered a new area of management research. The notion of supply chain activities has a long relationship with business (Li et al. 2014; Jie and Gengatharen; Thai, Jie, and Logistics 2018). Previous researchers have worked towards analysing the industrial or production chain rather than service supply or service logistics chain management (Seuring and Müller 2008; Croom, Romano, and Giannakis 2000; Burgess, Singh, and Koroglu 2006; Feng, Zhu, and Lai 2017; Stephens, White, and Mason-Jones 2016; Stank et al. 2015; Schaltegger and Burritt 2014). This scenario is rapidly changing as upcoming studies are more diversely interested in traditional supply chain research topics (Yawar and Seuring 2017; Dubey et al. 2017; Liu et al. 2015; Jin and Yang 2016; Fredendall, Letmathe, and Uebe-Emden 2016; Sajjad, Eweje, and Tappin 2015; Touboulic and Walker 2016; Brandenburg et al. 2014; Winter and Knemeyer 2013).

The definition of the supply chain has been immensely influenced by the authors' points of view, but is largely concentrated on building an extended relationship between suppliers, organizations and customers, as shown in Figure 1 (Mentzer et al. 2001). Based on this idea, Mentzer et al. (2001) classified the supply chain into three types: direct supply chain (Figure 1a), extended supply chain (Figure 1b) and ultimate supply chain (Figure 1c). A direct supply chain is conceptualised by keeping manufacturing organization in middle as intermediary between suppliers and customers.

<<Include figure 1>>

The supply chain can be defined as a set of three or more entities (organizations or firms) directly involved in the upstream and downstream flow of products, services, finances, and/or information from a source to a customer (Mentzer et al. 2001). Other authors in the field come to the same conclusion in their published works (Anklesaria 2008; Chopra and Meindl 2007; Hugos 2003; Shapiro 2001; Kurata and Nam 2013; Carter, Rogers, and Choi 2015).

In terms of defining supply chain management, authors definitions varied based on the author's understanding and contextual viewpoint (Mentzer et al. 2001; Asgari et al. 2016; Ellram and Cooper 2014). In the beginning, the supply chain management concept originated from the value chain insurgence (Dale et al., 1994), philosophies of material control and unified logistics (Carter and Price 1993; Forrester 1961), manufacturing linkages (Ford 1990; Jarillo 1993), improved motivation (Porter 1987; Snow, Miles, and Coleman 1992) and productiveness

(Lamming 1993; Womack, Jones, and Roos 1990). Table 1 highlights the valuable contributions towards the notion of the supply or value chain management. Past scholars have also framed the topic to describe inter organizational concerns (Harland, Lamming, and Cousins 1999), upright amalgamation (Snehota and Hakansson 1995; Thorelli 1986), supplier connections (Hines 1994; Narus and Anderson 1995; Saban, Mawhinney, and Drake 2017), and procurement related issues (Farmer 1997).

<<Include table 1>>

2.2. The integration of service elements with supply chain management

Past authors have found it particularly difficult the field of service supply chain given its nature and coverage of the business activities (Tseng et al. 2018). Analogous to manufacturing supply chain - services supply chain involves several broad entities such as service providers, suppliers of sub-services or resources needed for the design and delivery of services, and service clients or customers - all working together to co-produce value in diverse value chains or networks (Giannakis 2011a). Historically, majority of operation management research was focused on the manufacturing/production processes, but recent trends show a change as there are new studies emerging on service operations management (Kathawala and Abdou 2003; Liu, Ge, et al. 2014; Liu, Liu, et al. 2014; Li et al. 2016). Defining the service supply chain is not an easy task, as it involves multiple actors/entities in the service creation and delivery phases when compared to the production supply chain (Spohrer et al. 2007; Sigala 2014; Liu et al. 2012). One of the pertinent question in case of service supply chain is the scope of the conceptual model developed – broad or narrow view. Some of the previous definitions are presented in Table 2.

<<Include table 2>>

Service suppliers, often characterized as a focal firm, pull resources from diverse sub-contractors and assimilate these resources into the creation of a “core service” which is distributed to the end customer (Baltacioglu et al. 2007; Liu, Bai, et al. 2017; Tseng et al. 2016). In 2006, Sampson and Froehle looked at the service supply chain to create a unified model for all the service activities in a broad view. They pointed out the differences, especially the bidirectional nature of the service supply chain. Their qualitative research pointed out that service supply chain tends to be the hub rather than the chain and were smaller in size which eventually narrowed down the definition of service supply chain. It was also suggested that the service supply chain also needed to be robust enough to handle random order arrivals, inconsistent specifications and varying input quality. Similar suggestions were made by other researchers as well (Lovelock 1983; Sampson 2000; Stuart 1997; Bustinza, Parry, and Vendrell-Herrero 2013; Johnsen, Miemczyk, and Howard 2017; Lay et al. 2010). In 2011, Lillrank and Sarkka reviewed the existing theoretical literature on outsourcing, operations management, contracting, and governance to explore a new conceptual model for governing outsourcing arrangements, using an inbound voice call centre as an example. Their supply chain also inherited double directional input flows given consumers also supply inputs. Another reason behind the scarcity of service supply chain models may be attributed to the traditional

focus on the more widely accepted models, an obstacle to the development of service supply chain literature (Nie and Kellogg 1999). Roth and Menor (2003) proposed another methodology where their approach was to create an agenda for service operations management research. They placed importance on expanding service operation boundaries and customer experience. In recent time, Li, Jiang, and Liu (2012) considered interaction between two service suppliers each with a distinct line as a standard of service supply chain. Clientele joined one queue upon entrance and can change in real time amid lines to exploit their spot utility that is a purpose of queue length and price within the system.

Given the past scholarly works, several issues can be identified to shape the service supply chain research agenda in future. The managerial implications of the past research frameworks need to be comprehensively assessed and structured to make them more understandable to common practitioners. Thus, a systemic literature review of service supply chain operations would be of great scholarly interest to practitioners and researchers in this field.

3. Research methodology

Conceptual literature analysis is an integral part of any management research (Baker 2000; Cooper 1988) and is used to gather knowledge (from past academics) to develop a coherent and clear understanding of a particular research topic to identify literature gaps and provide new research directions (Rowley and Slack 2004; Tranfield, Denyer, and Smart 2003). Our research methodology built on similar concepts of analysing current accessible literature on the service supply chain in a systematic manner. Throughout this systematic literature review process, we used several criterion to select and analyse scholarly works in a highly transparent and replicable manner (Vom Brocke et al. 2009).

In the last few decades, different systematic literature review processes have been introduced (Colicchia and Strozzi 2012; David and Han 2004; Newbert 2007; Seuring and Gold 2012; Habib, Bastl, and Pilbeam 2015). Unfortunately, most of them have a common disadvantage: their core focus is only on the analysis and synthesis (Fischl, Scherrer-Rathje, and Friedli 2014). This paper overcomes this limitation by employing a modified model created by vom Brocke et al. (2009) to process the literature with a broader view. Some of the steps involved in this process are:

1. Conceptualization and origin of the key terminologies
2. Defining the review scope
3. Systematic literature search
4. Literature analysis and synthesis
5. Findings and managerial implications

As per the abovementioned steps, the conceptualisation and origins of key terms used in the service supply chain have been detailed in Section 2 and current thoughts that provide focus and context to this research field are organised. A broad definition of the key terminologies used in the service supply chain field is given with the help of textbooks, journal papers and

handbooks consistent with good practices of the systematic literature review (Zorn and Campbell 2006; Baker 2000). The following section provides details on defining the review scope in this paper.

4. Defining the review scope

In this section, the literature review scope is defined based on the Cooper's (1988) taxonomy of six dimensions: focus, goals, organisation, perspective, audience and coverage. Table 3 shows the review scope used while conducting the current literature review.

<<Include table 3>>

Each of the six dimensions are explained as follows:

- i. *Focus*: the focus of any research can be defined typically by the emphasis of the researchers' intention through research outcomes, methods, theories and applications analysis (Bem 1995; Torraco 2005). In this systematic review of service supply chain research, outcomes or theories can be defined as the key focus of the paper, given that the amount of past research in this context is very limited and at the same time a common understanding is very much required. Thus, this paper will focus on creating a new understandable theory of service supply chain through research outcomes.
- ii. *Goal*: The goal of a literature review may be an amalgamation or production of past literature, a critical analysis of existing literature, or the identification of issues central to a field (Cooper 1988). This paper concentrates on integrating the works of past research on this field to create a new framework for future knowledge.
- iii. *Organization*: Cooper (1988) recommends a historical, conceptual and/or methodological structure to organize a research paper. In this paper, conceptual structure is used rather than historical or methodological structure, given the goal of the paper is based on outcome and theories. Also, conceptual organization works well with past literature integration.
- iv. *Perspective*: Perspective is the personal viewpoint or predetermined understanding of a topic (Crotty 1998). In this review paper, the natural perspective has been used to understand the position from a simple point of the spectators.
- v. *Audience*: The audience are the readers or knowledge gathers of the research outcomes and have the unique ability to influence the writing and presenting style of the researchers (Bem 1995). Given the scarcity and future impact of the scholarly work, the main audience of this paper will be researchers and practitioners working in service supply chains.
- vi. *Coverage*: Coverage can be defined as the base of a review scope. Given the modern high pace research environment, this paper focuses the sample selection for this literature analysis work to be representative of the size and presence of service industries.

5. Systematic literature search

A systematic literature search process is key to any proper literature review. A literature search encompasses the querying of scholarly databases using keywords and retrograde searches to source relevant articles (Webster and Watson 2002). As per the work of vom Brocke et al. (2009), this paper uses a non-repetitive strategy to search through the current databases, as described below:

- i. *Journal Selection:* Modern day literature searches primarily rely on journal databases. To maintain a level of research quality within a range of fields, academics need to look to the literary works of fellow researchers in the form of journals and conference proceedings (Rowley and Slack 2004). This paper used peer reviewed journals rather than conference proceedings. The search process was performed in a highly controlled manner and was further refined by the high publication standards of journals (Flick 2008). This paper used “The International Guide to Academic Journal Quality” – by the Academy of Business School and Australian Business Dean’s Council ranking to address the quality issue and select the best journals. Apart for this, around ten percent of additional journal papers were also selected due to their high citation records.
- ii. *Database selection:* A number of databases are available for management researchers. Given the content of this paper, we used the four most distinguished research paper databases: EBSCOhost, Emerald, ProQuest and Science Direct.
- iii. *Keyword search in database:* A set of keywords synonymous to the objective of the search was used in the process. As given in Table 4, four sets and twelve subsets of keywords or phrases were searched within the four databases. From the results, we picked the journal articles which we found the most suitable for our research objective. After deducting the duplications, the keyword search phase generated 79 articles relevant to this literature review.

<<Include table 4>>

- iv. *Backward and forward searches:* In the last step of the journal search, a forward-backward search procedure was initiated. Past researchers have argued that occasionally, for unavoidable reasons, important journals can be overlooked (Zhou and Ye 1988). A forward-backward search through the timeline ensures that these journals are picked up for analysis. Figure 5 represents the journals collected through the forward-backward timeline analysis and our result revealed the same result (in terms of resulting set of papers identified for review) after removing duplicates.

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6. Analysis and Synthesis of selected literature

In order to conduct a transparent representative synthesis of the 79 collected papers, a content-based analysis was undertaken. A list of the journals where the papers are from is attached at table 6.

<<Include table 5>>

The initial analyses revealed that the papers were highly dominated by case analysis and empirical studies: 86% separated equally (Figure 3). Editorial was only 1%, literature reviews focussed on “the characteristics of the service system supply chain” covered the rest. An empirical study was the preferred method for the researchers to find a definitive answer for a particular research question of this field. On the other hand, case study was the second most preferred method to investigate problems in the service supply chain within a particular case.

<<Include figure 3>>

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However, a further in-depth analysis of the contents of the 79 papers revealed that despite being published in different journals, there were nine generic groups (in terms of problem focus in the service supply chain): production processes, human resources, logistics, information technology, theory and model generation, productivity and profitability, environmentally friendly practices, customer satisfaction and cross-disciplinary studies (Figure 3 and 4).

- i. *Production process*: Like the general supply chain, articles related to production processes dominated this field with nearly 27% (18 articles) related to production/service creation processes. This is consistent with the findings of other researchers of this field (Fischl, Scherrer-Rathje, and Friedli 2014). Table 5 contains a brief description of the findings of previous scholars. From the analysis, it can be observed that given the complexity of the service organizations, past researchers mostly used country-based case studies to understand the challenges related to the service supply chain (Haszlinna Mustaffa and Potter 2009; Rahimnia and Moghadasian 2010). Their preferred sector of investigation was predominantly the health service give its generic supply chain nature (De Vries and Huijsman 2011; Lillrank, Groop, and Venesmaa 2011). The key research interest in most of these papers was service supply chain integration (Braziotis et al. 2013). However, their approach varied from case to case (Saccani, Johansson, and Perona 2007), as per the needs of the service supply chain industry, as they commonly focussed on operational or strategic integration (He and Lai 2012). For example, service outsourcing in manufacturers’ supply channel strategies (Bian, Lai, and Hua 2017), organizational design change in multinational supply chains (Roh et al. 2017), and global quality of the service level (Zhang et al. 2017). A key concern was the servitization movement (Braziotis et al. 2013; Alghisi, Saccani, and Control 2015). Past researcher were particularly interested on the question of after sales service (Guajardo, Cohen, and Management 2018; Murali et al. 2016; Sun

et al. 2018). In one hand, it can be argued that they are part of a larger supply chain on the other hand they could be a separate service supply chain also given the nature and operation of the system. A detailed record of past researchers' findings can be found in Table 5.

- ii. *Productivity and profitability:* Output and cost-effectiveness related studies were the second largest group representing 18% of the literature in this field mostly focusing on process simplification. These studies mostly employed different financial tools to measure performance and standards through which they tried to estimate the industry competitiveness in the case of service supply chains (Table 5). By doing so, they effectively created different generic models for service industries to be used to maximize production and financial efficiency (Durugbo and Riedel 2013; Fu et al. 2013; Martin et al. 2017). These models emphasised structured operational planning (de Leeuw and Wiers 2015; Selviaridis and Norrman 2014) or computer operated automated systems (Fairchild 2005; Vickery et al. 2003). They also highlighted the different performance improvement techniques through reducing backlog (Anderson and Morrice 2000) or high workloads (Akkermans and Vos 2003). These studies attempted to deliver direction for stakeholders who wanted to oversee a business process and administrators who wanted to uninterruptedly progress an existing system (Cao and Jiang 2013). They found that each party could be beneficial in using bidirectional options contracts (Chen, Wan, and Wang 2017) or when sensitivity was low (Yu and Xiao 2017). Another study established that demand uncertainty and service requirements affected buyers' optimal ordering policies (Hu and Feng 2017).
- iii. *Theories and model generation:* The service supply chain has been regarded as one of the most prominent and upcoming research topics in the managerial and operations management area. Current established theories and models for this sector are scarce compared to other operations management areas. This systematic literature analysis revealed only eight articles (10% of the total) discussed service supply chain theories and models. Most of these studies discussed the basic framework of the service supply chain using explanatory models. Only one paper performed a systematic literature review on environmentally sustainable or green logistics practices involved in the service supply chain (Rossi et al. 2013). Another paper looked into the strengths and weaknesses of past research (Burke et al. 2004) and how to use it to deal with the upcoming challenges and opportunities of the field (Youngdahl, Ramaswamy, and Verma 2008; Choudhury and Daly 2019). In 2000, Youngdahl and Loomba extended the service supply chain to a global context which opened debate on service supply chain theories. Where some authors used or prescribed generic models (Giannakis, M., 2011), others prescribed case-by-case based solutions for the service sector (Zu and Kaynak 2012).

<<Include table 6>>

- iv. *Information technology*: Past researchers put great emphasis on the use of information technology for the advancement of the service supply chain. One of the core pillars of the service supply chain was identified as technological assistance. The systematic analysis identified eight papers, or 13%, related to the use of information technology in the service supply chain field. There is still a lot of scope for future research in this field (Venkatesh 2013). The findings of these papers pointed out the lack of consistency and the need for quality data to further progress research in this field (Bhakoo and Chan 2011). The use of hybrid solutions for the flow of goods and services could be very helpful for this purpose (Holmström and Partanen 2014; Véronneau and Roy 2009). But overall, their conclusions were positive about customer satisfaction on the issue of increased technological use in the service supply chain (Croom and Johnston 2003; Zsidisin, Jun, and Adams 2000). Recently, with the development of online shopping, manufacturers have extended their traditional retail channel and adjusted pricing and servicing decisions to enhance customer satisfaction (Wang, Song, and Wang 2017).
- v. *Logistics*: In the service supply chain, logistics have been given lesser attention than other sub-sectors of this field. This may be due to the lack of physical product movement in service management. Eight papers (10% of the total) were identified as seminal research publications in the logistics sub-field. Most of the academics were interested in optimal quality for the logistics system, based on the integration of service components (Piplani and Saraswat 2012). Increasingly, improving the quality of logistics operations resulted in increased cost of logistics operations (Wei-hua et al. 2011). Reducing logistics costs resulted in a decrease in customer satisfaction. Thus, logistics operations should incorporate a system approach with strategic orientation (Aronsson, Abrahamsson, and Spens 2011). The increase in logistics service quality could lead to greater customer demands with positive elasticity (Liu and Xie 2013), and eventually may create healthier relationships with consumers (Li et al. 2012), and enhanced financial return on investments (Qin, Su, and Huang 2017). More recent publication has identifies logistics as one of the most contemporary issue in service supply chain (Li and Society 2014).
- vi. *Human resource related*: Only four papers focussed on human resources. Authors looked into the service contracts for the supply chain and at how those contracts influenced service supply chain coordination (Sieke, Seifert, and Thonemann 2012). Another study focused on job satisfaction and industrial commitments across different workforce levels (Maloni et al. 2017). The remaining two studies found that collaborative decision-making could improve the workforce satisfaction level and operational performance in the service supply chain (Mandal and Jha 2017; Nematollahi, Hosseini-Motlagh, and Heydari 2017).
- vii. *Environment friendly practices*: The “green” supply chain is one of the most recent research issues in supply chain management. The same initiative to incorporate environment friendly practices can be found in the service supply chain. In the systematic literature review, four papers were related to this issue. Most of the authors

looked mostly at energy efficiency and performance in service delivery management (Genovese, Koh, and Acquaye 2013; Saha et al. 2019) and proposed models to retrofit the service supply chain (Chithambaranathan et al. 2015). Zhang, Joglekar, and Verma (2014) proposed using eco-certificates to boost the green management of service supply chains. As such, the service providers (with eco-certificates) achieved higher profit than their non-conforming counterparts.

- viii. *Customer satisfaction*: Five papers were identified that related to customer satisfaction. These papers mostly focused on the relationship between marketing and service operations. In doing so, they looked at issues such as marketing mix for the service supply chain (Keller et al. 2006); a marketing operations interface (Kurata and Nam 2010), managerial implications of different marketing decisions (Sampson 2000), service quality coordination (Qin et al. 2017) and dual buy-back contract decisions (Heydari, Choi, and Radkhah 2017).
- ix. *Others*: About 6% of the selected articles were cross-disciplinary in nature. They looked at issues like using the Nash equilibrium (Liu and Wang 2015; Liu, Xie, and Xu 2013) and the contingency theory (Yuen et al. 2017) to enhance service supply chain performance, and different scopes of scheduling effects on service supply chain (Brunner and Bard 2013; Wren et al. 2003; Chai, Liu, and Ngai 2013).

7. Future research agenda, new conceptual framework and conclusion

In this paper, a comprehensive and systematic review of literature in the field of service supply chain was conducted. This study enabled us to concisely describe the service supply chain from a knowledge perspective and to define a future research agenda.

The systematic literature review was conducted based on the principles of (Vom Brocke et al. 2009). Based on the analysis and synthesis in Section 6 and Table 5, it can be suggested that the service supply chain methodology is still at a preliminary stage but with increasing interest from researchers and practitioners. The majority of service supply chain research has been focused on the more traditional concepts of supply chain management. The nature of the service supply chain is different from the characteristics of the traditional supply chain system. Consequently, the robustness of ideas underpinning this area has not been fully investigated by the academic community. If the present trend continues, there is a high risk of knowledge narrowing down in the area of the service supply chain. Thus, a more cross disciplinary approach is required to understand and develop this research area. Issues such as logistics, production processes and productivity are well discussed in the literature, therefore, future investigations should focus on environmentally friendly practices, better market orientation and service provider–customer relations. Dealing with these contemporary issues will also explore new ways to improve service operations and increase productivity and profitability. The use of superior technological infrastructure and modes are relatively a well understood practice in a productive supply chain (Puspitasari and Jie 2018). Thus, more research efforts

should be devoted to incorporating these technological advancements in the service sector. From the synthesis recorded in Section 6, it can be clearly seen that the service supply chain differs from industry to industry so future research should be industry specific. Figure 5 incorporates these recommendations for future researchers and shows that, given the needs and requirements of practitioners, future service supply chain research should focus on four segments: environmentally friendly practices, market relationships, information technology infrastructure development and industry specific study.

<<Include figure 5>>

This study provides useful insight into the service supply chain research. One possible direction of research could be to study the future framework presented in this paper. This could be in the form of the cross-tabulation data and/or content analysis presented in this study. Another way of extending this work would be to include and correlate knowledge from other disciplines, theoretical perspectives, intellectual trends, and traditional practices associated with service industries. These future inquiries will help researchers to test and relate the findings of this paper to better judge the different claims made in the service supply chain discipline.

Finally, the topic of the service supply chain offers a variety of interconnected cross disciplinary research opportunities. Past researchers emphasised the delegation of resources in accordance with the need of the services. Based on the service requirements and demands of the customer, the service supply chain can change dramatically. Hence, the body of knowledge of the service supply chain discipline needs to assist service industries to decide if current managerial strategies are good enough to support ongoing investment or if they are simply the result of short-lived enthusiasm, and should cease to support scarce resources that could be used more effectively. In this regard, we have synthesized a new conceptual framework for the current service supply chain operations in figure 6. We have divided the process environment into four main parts- core process, external factors, internal factors and satisfaction feedback. The core process is further structured into three activities – service vendor, service delivery and end user where the service provider is continuously influenced by the external factors, internal factors and the customer satisfaction feedback (Liu, Zhao, et al. 2017a; Yang et al. 2018). We believe the interaction between this conceptual framework can easily describe any modern service operation function-ability.

We have investigated the coverage and objectives of the service supply chain research from a contextual narrative. It should be noted that service supply chain can cover a number of aspects relevant to various interdisciplinary contextualisation. As per our synthesis of the past literature, we have divided the research views on service supply chains into three generalised segments based on their coverage/scope and aim/objectives (see Fig. 7).

The service supply chain research can be classified into three major views – narrow, broad, and global view (see Fig. 7). The research involving narrow view of service supply chains are focussed on the process-specific and/or internal organisational considerations in terms of their

scope. The major objective of studies falling under this category aimed at maximising profits, validation of process models, and evaluation of process performances. In case of broader view, the scope for the research studies expanded to include multiple organisational partners working together to provide services. Typical research studies in this category involved supplier-producer relationship and collaborations among supply chain partners. The aim of these studies were to gain system wide efficiencies and prioritisation of processes for improved service delivery. Finally, global view of service supply chain deals with the development of theories taking into account discipline specific global context and/or multi- disciplinarity. Research studies falling under this category aimed at innovating processes, building theories to better understand service delivery in the global context.

It can be also noted that – with the increasing scope of research studies in service supply chain area; the aims of research studies varied from process-specific emphasis through to long-term process innovation, macro quality management as well as development of theoretical models. Given the complexity of service supply chains, a more border view of service supply chain in current business environment taking into account global perspectives will be of utmost importance.

Finally, we suggest that future researchers should understand the internal mechanisms of any service supply chain and produce case or industry-based research agendas taking into account global views. We hope that future researchers, academics, and practitioners will use these findings to further develop their understanding on the service supply chain but more importantly, supply chain academics could consider this study as a starting point to set their future research agenda in this area.

<<Include figure 6>>

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List of Figures and Tables

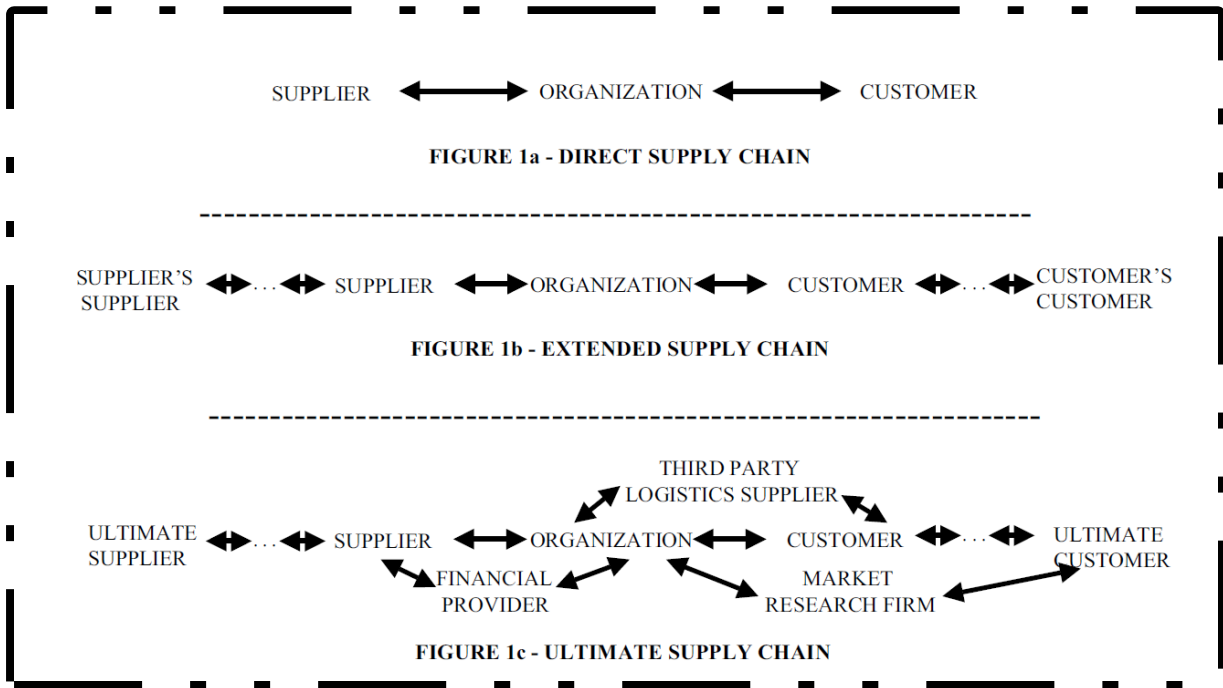


Figure 1 Supply chain model by Mentzer et al. 2001

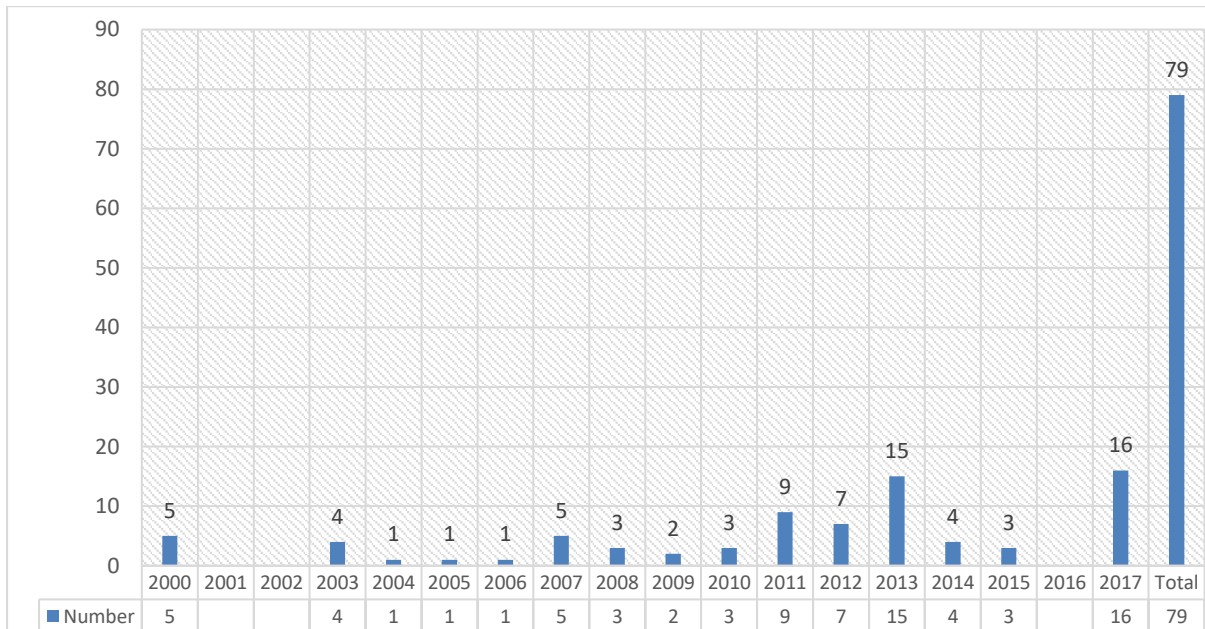


Figure 2 Backward and forward search result

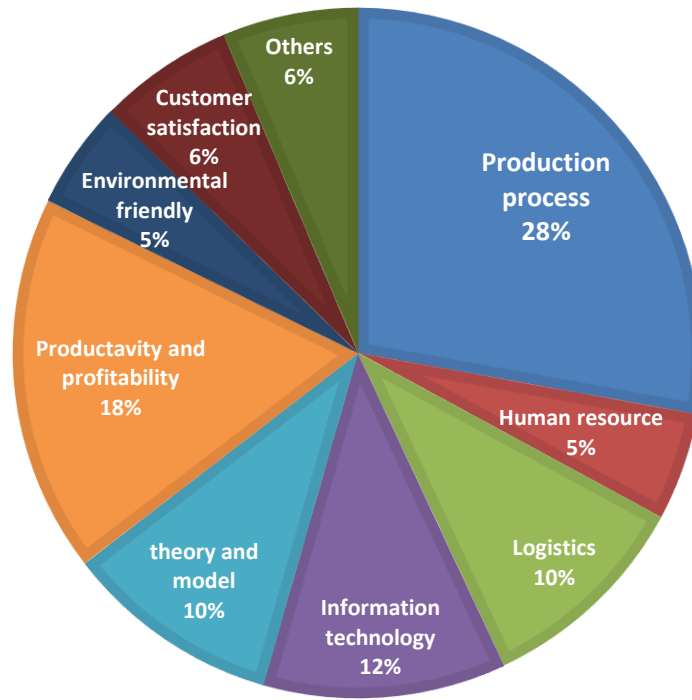


Figure 3 Classification and percentage subdivision of reviewed papers

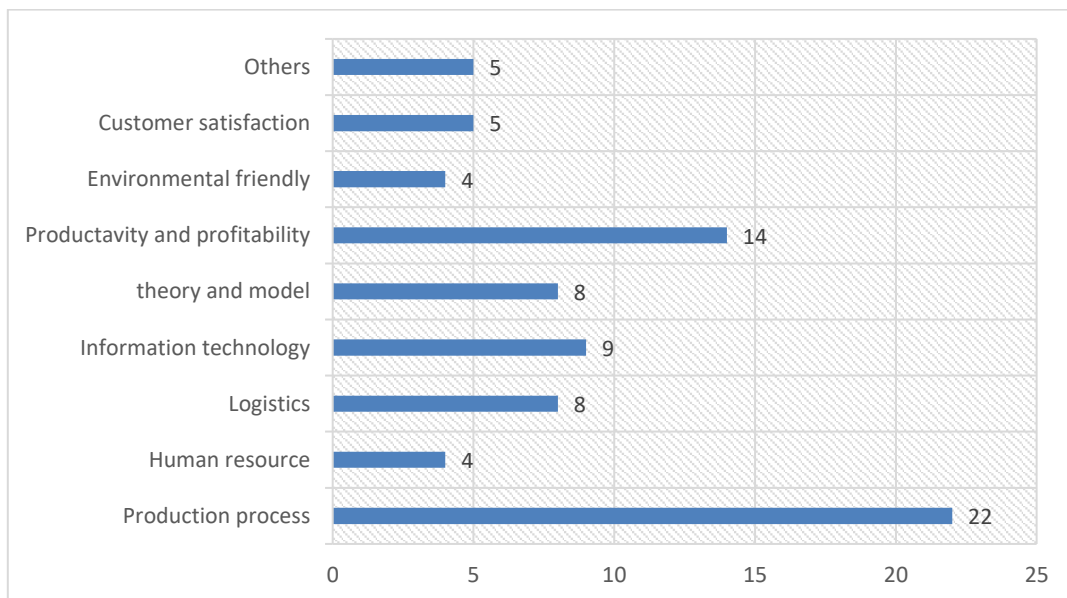


Figure 4 Subdivision of the reviewed papers

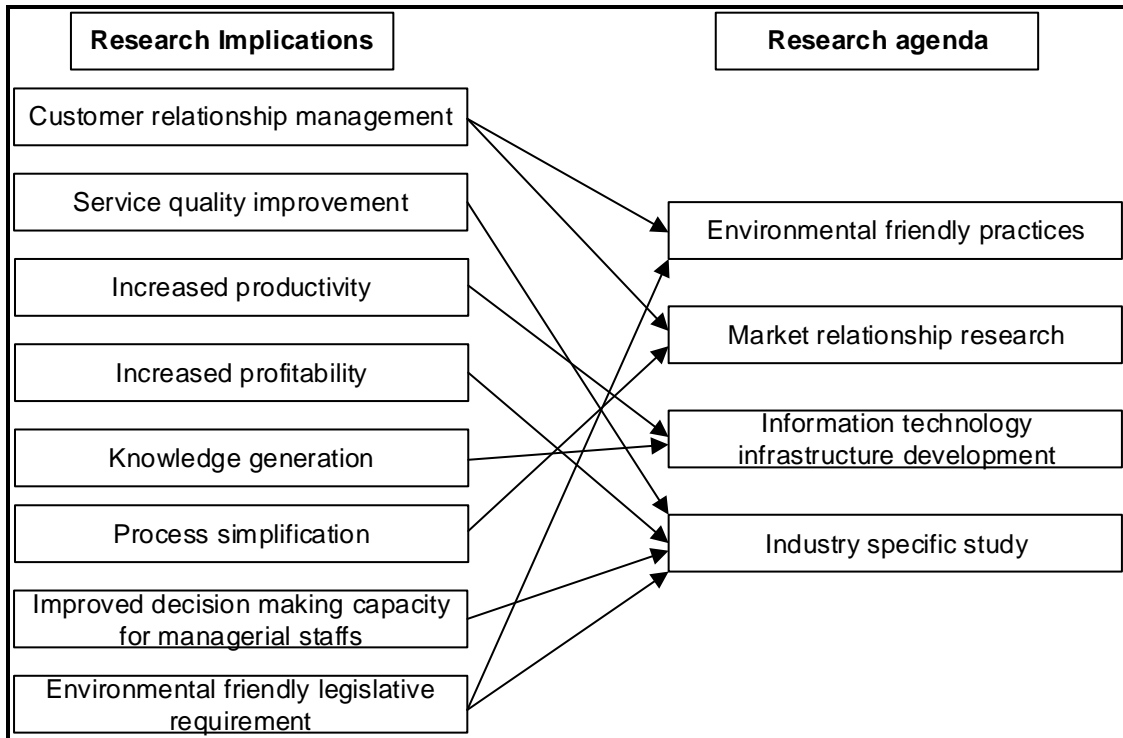


Figure 5 A new agenda for service supply chain research

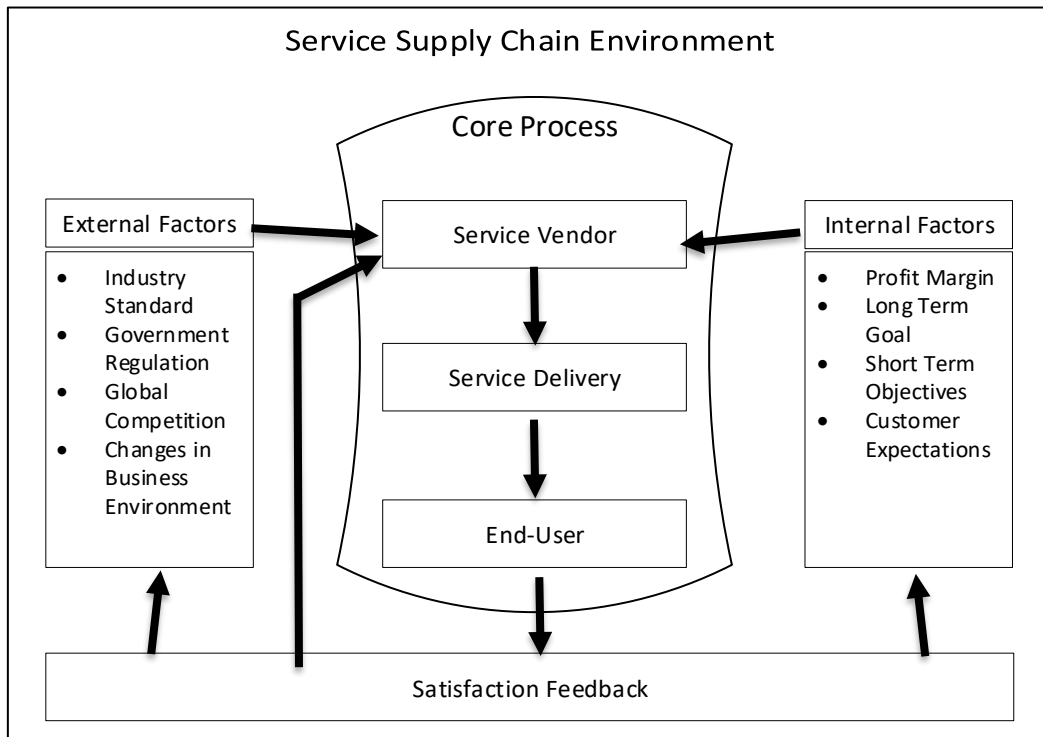


Figure 6 A new conceptual micro framework for service supply chain

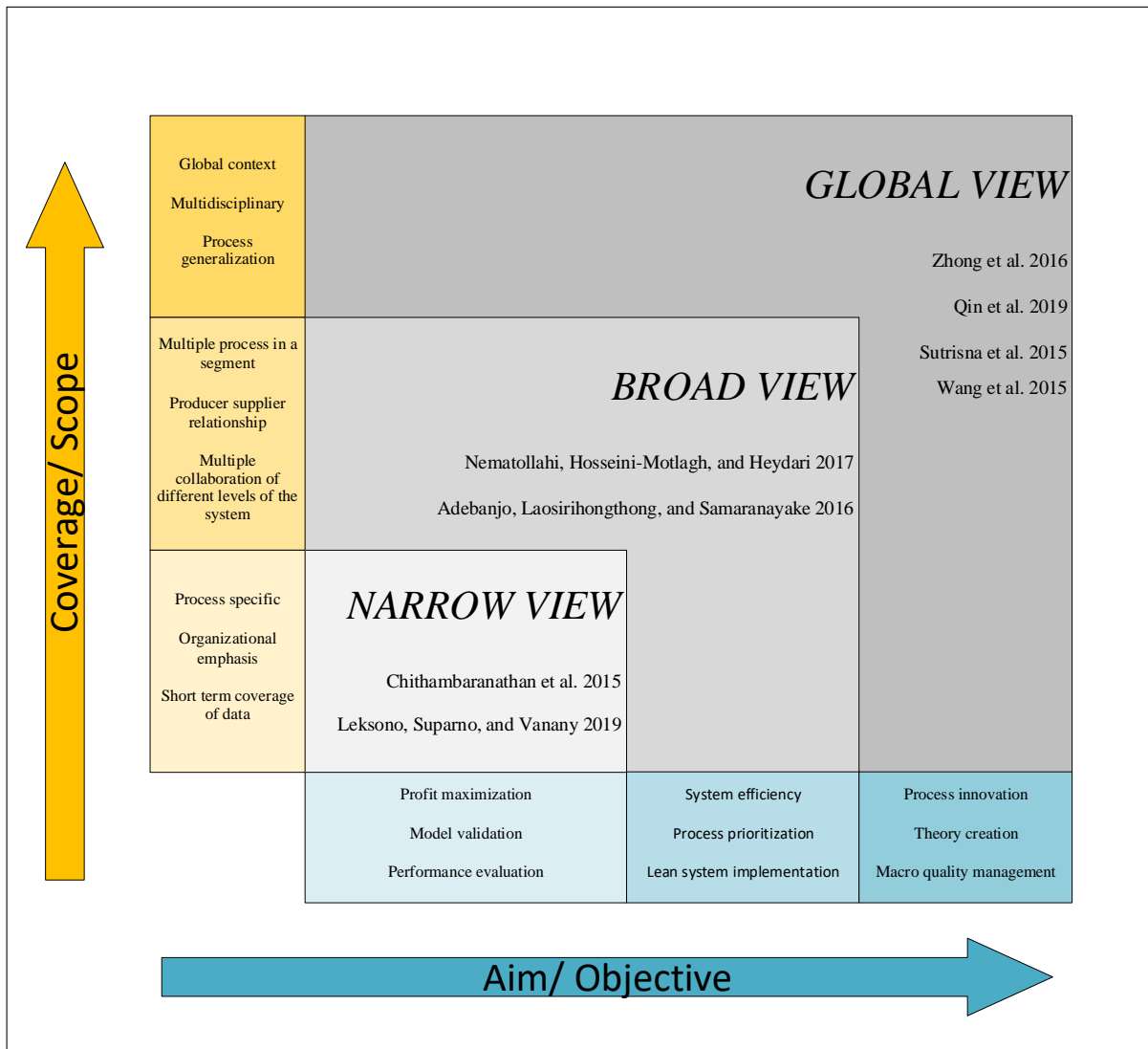


Figure 7 Service supply chain: Author’s macro framework

Table 1 Supply chain management definitions by different authors

Authors		Definitions
1	Fisher 1997	Supply chain management is a basic terminology created to label the planning and control of materials and information flows with logistics activities, not only within a company but also externally amongst companies (Fisher 1997).
2	Stevens 1989	The ideology of handling supply chain management is to harmonize the necessities of the customer with the flow of constituents from suppliers in order to consequence an equilibrium between what are often seen as contradictory goals of high customer service, low inventory management, and low unit cost (Stevens 1989).
3	Chen and Paulraj 2004	A representative supply chain is a network of materials, information, and service processing links with the appearances of supply, transformation, and demand (Chen and Paulraj 2004).
4	Houlihan 1988	Supply chain management calls for, and in the end is subject to, strategic decision making. “Supply” is a pooled objective of essentially every utility in the chain and is of particular deliberate consequence because of its impact on overall costs and market share (Houlihan 1988).
5	Jones and Riley 1985	Supply chain manages contracts with the total flow of resources from suppliers through to end consumers (Jones and Riley).
6	Melo, Nickel, and Saldanha-Da-Gama 2009	Supply chain management is “the process of planning, implementing and controlling the operation in an efficient way” Melo, Nickel, and Saldanha-Da-Gama (2009).
7	Handfield and Nichols 1999	Supply chain management can be defined as the holistic management approach for integrating and coordinating the material, information and financial flows along a supply chain (Handfield and Nichols 1999).

Table 2 Service supply chain definitions by different authors

Authors		Definitions
1	Giannakis 2011a	Analogous to the assembly of industrial goods, services fabrication involves the association of several performers; the service providers, the suppliers of other services or resources needed for the design and delivery of these services and the service clients, all working together to co-produce value in multifarious value chains or networks (Giannakis 2011a).
2	Bhakoo and Chan 2011	Service supply chains are characterized by their triadic nature, which is caused by the direct relationships between the different actors. The nature of these relationships and the level of integration and trust among different actors are major determinants of the capability of the supply chain to deliver services (Bhakoo and Chan 2011).
3	Baltacioglu et al. 2007	Service suppliers, often characterized as the focal firms, pull on the resources of assorted subcontractors and assimilate those resources into the creation of the “core service” distributed to the end customer (Baltacioglu et al. 2007).
4	Sengupta, Heiser, and Cook 2006	In service supply chains, human labour forms a significant component of the value delivery process and while physical handling of a product leads to standardized and centralized procedures and controls in manufacturing supply chains, for services this is not entirely possible as many of the decisions are made locally, and the variation and uncertainties in outputs are higher because of the human involvement. In addition, the focus of efficiencies in service supply chains is on the management of capacity, flexibility of resources, information flows, service performance and cash flow management (Sengupta, Heiser, and Cook 2006).
5	Gliatis and Minis 2007	Based on this distinction between goods and services, the bibliography proposes a series of features that characterize the supply chain. During service delivery, the customer participates in the process and can intervene, often to demand additional service of a particular kind or to request that some aspects of the service be changed. Also, the customer usually depends on the server in order for the delivery of the service to be complete. This close customer - server interaction reveals another important characteristic during service delivery: inseparability of production and consumption; that is, the producer - consumer interaction is necessary for the service to be delivered (Gliatis and Minis 2007) .
6	Li Li, Jiang, Liu, & Management, 2012	In this paper, we consider a system of two service providers each with a separate queue. Customers join one queue upon arrival and can switch in real time between queues to maximize their spot utility that is a function of queue length and price (Li, Jiang, and Liu 2012).

Table 3 Review Scope - Opportunity of literature analysis

Features	Classifications			
Focus	Research outcomes	Research methods	Theories	Application
Goal	Integration	Critics	Critical issue	
Organization	Historical	Conceptual	Methodological	
Perspective	Natural representation		Espousal of position	
Audience	Specialized scholars	General scholars	Practitioners	General public
Coverage	Exhaustive	Exhaustive and selective	Representative	Central

Table 4 Keyword search in EBSCOhost, Emerald Insight, ProQuest and Science Direct

		Search terms	Databases			
			EBSCOhost	Emerald	ProQuest	Science Direct
"Supply chain"	AND	"Service activities"	25	41	36	42
	AND	"Financial service"				
	AND	"Professional service"				
"Value chain"	AND	"Service activities"				
	AND	"Financial service"				
	AND	"Professional service"				
"Systematic coordination"	AND	"Service activities"				
	AND	"Financial service"				
	AND	"Professional service"				
"Logistics"	AND	"Service activities"				
	AND	"Financial service"				
	AND	"Professional service"				
Total Net Hits			144			
Duplications			65			
Result from keyword search			79			

Table 5 List of Journals reviewed

No	Name of the Journal
1	American Journal Of Agricultural Economics
2	Annals Of Operations Research
3	British Journal Of Management
4	Business Communication Quarterly
5	Business Horizons
6	Computer
7	Computers & Industrial Engineering
8	Cornell Hospitality Quarterly
9	Discrete Dynamics In Nature Society
10	Energy Policy
11	European Journal Of Operational Research
12	European Journal Of Purchasing & Supply Management
13	European Management Journal
14	Expert Systems With Applications
15	Harvard Business Review
16	Human Relations
17	Human Resource Development Review
18	Ima Journal Of Management Mathematics
19	Industrial Marketing Management
20	International Journal Of Logistics Management
21	International Journal Of Operations & Production Management
22	International Journal Of Physical Distribution & Logistics Management
23	International Journal Of Production Economics
24	International Journal Of Production Research
25	International Journal Of Service Industry Management
26	International Journal Of Supply Chain Management
27	Journal Of Applied Accounting Research
28	Journal Of Business Ethics
29	Journal Of Business Logistics
30	Journal Of Business-To-Business Marketing
31	Journal Of Cleaner Production
32	Journal Of Computer Science And Technology
33	Journal Of Operations Management
34	Journal Of Scheduling
35	Journal Of Service Management
36	Journal Of Supply Chain Management
37	Journal Of Systems Science And Systems Engineering
38	Knowledge, Technology & Policy
39	Management & Engineering
40	Management Decision
41	Managerial Auditing Journal
42	Mis Quarterly
43	Neurocomputing
44	Operational Research

45	Organizational Dynamics
46	Outlook
47	Procedia - Social And Behavioral Sciences
48	Procedia Engineering
49	Production And Operations Management
50	Production Operations Management
51	Production Planning & Control
52	Psychological Bulletin
53	Renewable And Sustainable Energy Reviews
54	Service Science
55	Strategic Management Journal
56	Supply Chain Management
57	Supply Chain Management Review
58	Supply Chain Management: An International Journal
59	Sustainability
60	The International Journal Of Logistics Management
61	The Journal Of Marketing
62	The Marketing Review
63	The Service Industries Journal
64	Transportation Journal
65	Transportation Research Part E: Logistics And Transportation Review

Table 6 Findings from different researchers based on category

Category	Focus area	Authors	Findings
Production process	<i>Stochastic optimal control theory submissions and acceptance</i>	Anderson and Morrice (2000)	Reorganizing control does not materially degrade performance, so long as statistics are shared.
	<i>Private hospitals, distribution and inventory management, pharmaceuticals industry, Malaysia</i>	Haszlinna Mustaffa and Potter (2009)	A framework for the supply chain mechanism is proposed, based around vendor-managed inventory. Blocks to achieving this goal are also identified, including deliberation of current supply chain management competences.
	<i>Professional services, health, Iran</i>	Rahimnia and Moghadasian (2010)	By breaking services into three pipelines, decoupling points for the supply chain are identified. The paper also suggests while conferring legality in a professional service organization, the important role of human resources should be emphasized.
	<i>Health services research, health care</i>	De Vries and Huijsman (2011)	The service supply chain should be regarded as a cross disciplinary issue for future research purposes.
	<i>Patient care, communication, integration,</i>	Meijboom, Schmidt-Bakx, and Westert (2011)	Four major problem categories are distinguished for the service supply chain: communication, patient safety, waiting times, and integration.
	<i>Process management, health care, operations management,</i>	Lillrank, Groop, and Venesmaa (2011)	Process management in service chains is appropriate in circumstances where there is an organized flow with a sufficient volume of similar repetitions.
	<i>Supply chain management, service operations</i>	Giannakis (2011b)	Six major practices for the construct of service supply chains are identified: plan, source, develop, adapt, operate, and recover.
	<i>Servitization, demand management, United Kingdom</i>	Braziotis et al. (2013)	The paper recommends that a mixture of administration tactics is required by firms which add services to their portfolio of traditional product offerings.
	<i>After-sales service, supply chain configuration, durable consumer goods</i>	Saccani, Johansson, and Perona (2007).	Configuration choices vary, signifying that no “one best way” exists. Furthermore, many firms develop numerous configuration styles.
	<i>Operational integration of supply chain, strategic integration of supply chain, product-based service</i>	He and Lai (2012)	This study discovers that operational incorporation of the supply chain has a direct and constructive effect on product-based service, while strategic incorporation has a direct positive effect on customer action-based service.
	<i>Revenue management, two-stage game, pricing and ordering.</i>	Wei, Hu, and Xu (2013)	Under the leader of the supplier the competition between the two retailers is eradicated and each retailer just remits its ideal magnitude.
	<i>Product service system, multi-attribute utility analysis, maintenance service level.</i>	Kuo and Wang (2012)	This study investigated altered types of cohesive maintenance service and used multi-attribute utility scrutiny to debate the overall value of maintenance service.
	<i>Third party logistics, action research, cost-to-serve framework, mathematical programming</i>	Ross, Jayaraman, and Robinson (2007).	Details mechanisms used by the global third-party logistics (3PL) companies to manage entire supply chains and how supply chain organizations plan and budget for a process change.
<i>Telecommunications industry, backlogs, bullwhip effects, service variability</i>	Akkermans and Voss (2013)	The study finds out the idiosyncratic drivers of the bullwhip effect in services, and the	

			managerial actions that can either trigger or mitigate these bullwhip effects.
	<i>Service, interaction, purchasing, buyer-supplier relationships, business services</i>	van der Valk and Wynstra (2014)	The paper discovers that for a technically homogenous service, major variances in required collaboration arise as a result of different usage situations.
	<i>Supply chain management, service</i>	Vandaele and Gemmel (2007)	PLS specify that the foundations shaping contentment with the external supplier and those determining satisfaction with the business service supplier differ.
	<i>Automotive industry, services, strategic planning</i>	Löfberg, Witell, and Gustafsson (2010)	A corporation's choice of service tactic looks to be subjective to its position in the supply chain. The main explanations for the modification in strategies seem to relate to variances in customer demand, the products to which the services were related, and the size of the companies.
	<i>Outsourcing, services supply chain, service provider</i>	Demirkan and Cheng (2008)	An effective decentralized mechanism is needed to achieve the goal of maximizing overall supply chain performance.
	<i>Service outsourcing, supply chain efficiency, channel power structure</i>	Bian, Lai, and Hua (2017)	The paper investigates the impact of service outsourcing on pricing and service, and found that lower prices and higher service levels can, but never simultaneously, occur in a decentralized channel compared to the integrated channel.
	<i>Multinational supply chain organizations, organizational design change, organizational change theory</i>	Roh et al. (2017)	This study identifies and elaborates internal and external drivers of organizational design change in the context of multinational supply chain management organizations.
	<i>Manufacturing service supply chain, multi-objective, quality of service</i>	Zhang et al. (2017)	This paper proposes a new fuzzy quality of service (QoS)-aware multi-objective mathematical model for evaluating the global QoS value of a manufacturing service supply chain.
	<i>Collaborative networked organisation, product-service systems, value co-creation, complex networks, conceptual modelling, graph theory</i>	Durugbo and Riedel (2013)	A theoretical model is projected for assessing the readiness of concerted networked organisations for product-service system distribution.
Productivity and profitability	<i>Supply chain management, supplier relations, financial services</i>	Field and Meile (2008)	Use of information technology, electronic information-sharing, supplier type, and firm size, better supplier relations are associated with gratification with overall supplier enactment.
	<i>Public warehouse, WPSS, service capability, maturity, analytical target cascading</i>	Cao and Jiang (2013)	This paper provides guidance for both investors who want to figure a public warehouse and administrators who want to uninterruptedly progress an existing one.
	<i>Manpower planning, service providers, retailers, financial crisis</i>	de Leeuw and Wiers (2015)	The study outlines how higher functioning planning is a key approach to counter the effects of the financial calamity.
	<i>Supply chain integration, financial performance, structural equations modelling</i>	Vickery et al. (2003)	The study exhibited positive direct associations between (1) unified information technologies and supply chain integration, (2) supply chain incorporation and customer service, and (3) customer service and firm enactment.
	<i>Supply chain management, agency theory, risk management, service industries, service supply chains</i>	Selviaridis and Norrman (2014)	The study finds the following factors used to influence provider willingness to bear PBC-induced risk: performance attributability within the service supply chain; relational governance in service supply chain relationships; provider risk and reward balancing; and provider ability to transfer risk to sub-contractors.

	<i>Professional service supply chain, high performance work systems, professional service firms, teams</i>	Fu et al. (2013)	The outcomes specify the positive link between HPWS and the skilled service supply chain performance.
	<i>Financial institutions, open systems</i>	Fairchild (2005)	Drivers for intelligent matching resolutions have the ability to link financial matching events to other supply chain activities.
	<i>System dynamic, business games</i>	Anderson and Morrice (2000)	Administrators can effectively use end-user demand information to reduce backlog and capacity adjustment costs.
	<i>Service operations, amplification, case study</i>	Akkermans and Vos (2003)	The study finds a new root cause for amplification: interactions of high workloads and reduced process quality that reinforce each other once workloads pass a certain threshold.
	<i>Service requirements, financial flow</i>	Martin et al. (2017)	Focuses on finding the reasons to involve financial service providers through supply chain finance practices in the integrated supply chain.
	<i>Bidirectional option contracts, risk management coordination, service requirements</i>	Chen, Wan, and Wang (2017)	The study finds that the service level with bidirectional option contracts is beneficial to both retailers and suppliers.
	<i>Revenue sharing contracts, service requirement, service contracts</i>	Hu and Feng (2017)	This paper models a supply chain of service requirements and finds that the buyer's optimal ordering policies are not only affected by demand uncertainty, but also by service requirements.
	<i>Game theory, channel leadership, agri-product, service level</i>	Yu and Xiao (2017)	This study develops two Stackelberg models to investigate the pricing and service level decisions of a fresh agro-products supply chain and finds that that when the service sensitivity is low, each player can obtain a higher profit under the logistics provider.
	<i>Sustainable supply chains, learning capabilities, innovation, service providers</i>	Rossi et al. (2013)	The systematic literature review improves the prevailing literature by drawing on three bodies of information, i.e. logistics service providers, eco-efficiency and logistics innovation, and puts them into a solitary agenda.
Theory and model generation	<i>Nurse rostering, hospital personnel scheduling</i>	Burke et al. (2004)	Focuses on the metiers and faintness of the literature to summary the key issues that need addressing in future nurse rostering.
	<i>Offshoring, service, knowledge, outsourcing, Information</i>	Youngdahl, Ramaswamy, and Verma (2008)	The paper provides a site for presenting standpoints on the operational and cross-disciplinary encounters and openings in the area of service and knowledge offshoring.
	<i>Service industries, conceptual framework, research agenda</i>	Baltacioglu et al. (2007)	This research develops a new model for service supply chains and applies it to the healthcare business.
	<i>Quality management, suppliers, agency theory</i>	Zu and Kaynak (2012)	This paper finds that rather than trusting on one broad supply chain quality management approach for all suppliers, firms need to choose different management instruments for different suppliers based on the prominent attributes of individual suppliers and their relationships with the buyers.
	<i>Service operations, service delivery systems</i>	Youngdahl and Loomba (2000)	The purpose of this paper is to extend the concept of the service factory to global supply chains.
	<i>Visibility, industrial services, asset management, operations management</i>	Holmström, Brax, and Ala-Risku (2010)	An illustrative model of three separate provider-customer constellations is conceptualized that reflects specific types of visibility: cooperative service supply chain management, condition-based maintenance as

			a service and visibility-based asset management.
	<i>Service industries, conceptual framework, research agenda</i>	Giannakis (2011a)	The paper lures insights from the current agendas for SCM and takes into account the peculiar physiognomies for the production and delivery of services across several service industries to make a conceptual framework.
	<i>Procurement, business performance, business support services, organization and methods</i>	Croom and Johnston (2003)	The paper finds that customer gratification is central to the success of e-procurement and is a momentous element of the cost benefits to be gained from its adoption.
Information technology	<i>Service quality, channel relationships</i>	Zsidsin, Jun, and Adams (2000)	As a “communication channel intermediary”, the case study firm delivers a high-quality service to customers located upstream, as well as downstream in its service system.
	<i>Petri net, incremental modelling, flow, resources, service-oriented manufacturing systems</i>	Popescu, Soto, and Lastra (2012)	This study defines how to habitually integrate properties in a Petri-net-derived model of flow that is amendable at runtime to reflect and influence the routing in a manufacturing line.
	<i>IT, supply chain, services</i>	Venkatesh (2013)	The paper reports on further research topics.
	<i>E-commerce, E-services; service operations, MIS/operations interface</i>	Rabinovich (2007)	The paper finds that online consumer admittance to information on retail mark-ups coerces retailers to market a level of service quality that is dependable with that mark-up information.
	<i>Information technology, innovation, manufacturing,</i>	Holmström and Partanen (2014)	The institution of digital business will likely result in hybrid solutions, combining unadventurous logistics, digital manufacturing, and user operations.
	<i>RFID deployment, cruise ships, service supply chain, technology evaluation, global operations</i>	Véronneau and Roy (2009)	The study displays that in opposition to current beliefs in the literature, density of flow of goods and not the scale of operations, determines whether a good return on speculation is realizable.
	<i>Electronic commerce, pharmaceutical products, health care, Australia</i>	Bhakoo and Chan (2011)	This study recognizes the lack of reliability and poor data quality as key issues in the e-business operation in the supply chain. It also opinions out the necessity for partnership and confidence for a successful operation.
	<i>Pricing and service decisions, dual channel-retail game theory</i>	Wang, Song, and Wang (2017)	This study finds useful insights of pricing and retail service in problem of complementary products in a dual-channel supply chain environment.
	<i>Health care, lean production, agile production, health services sector</i>	Aronsson, Abrahamsson, and Spens (2011)	The service supply chain is about establishing a quick response and flexibility in a hybrid strategy through combining lean and agile process strategies.
Logistics	<i>Logistics service supply chain (LSSC), emergency order allocation, uncertainty, emergency cost coefficient</i>	Wei-hua et al. (2011)	The paper finds the cost of logistics service integrator (LSI) is accumulating, while the total satisfaction and capacity reliability of all functional logistics service providers (FLSPs) is lessening in logistics service supply chains.
	<i>Logistics service supply chain, pre-estimate behaviour, order allocation, rational expectations equilibrium</i>	Chai, Liu, and Ngai (2013)	The paper finds that order allocation consequences taking the REE into attention are better than those when the REE is not considered.
	<i>Logistics, Contemporary issues</i>	Li (2014)	The logistics issue regarding the people’s livelihood becomes a hot spot. The traditional

			research in this regard is related to perishable product, fashion product, and electronic product, which have short life cycle. Nowadays, such topics might include city logistics, emergency logistics, and agriculture supply chain.
	<i>Relational benefits, logistical service, long-term business relationship</i>	Li et al. (2012)	The paper finds that the building of a long-term association is facilitated by trust and commitment from manufacturers.
	<i>Quality guarantee, logistics service supply chain, quality supervision effort, performance loss rate</i>	Liu and Xie (2013)	The paper concludes that optimal quality defect guarantee of the FLSP increases as customer punishment upsurges, and drops as the elasticity of the customer demand for the quality defect guarantee increases.
	<i>Third party logistics (3PL), budget-constrained retailer</i>	Chen and Cai (2011)	The paper finds that the control role and supplier credit models can outclass the classic newsvendor model without budget restrictions.
	<i>Logistics service supply chain, order allocation, multi-objective</i>	Qin, Su, and Huang (2017)	A two-echelon logistic service supply chain is studied, and considers demand updating and the fairness preferences integrator to maximise profit.
	<i>Service level, contract management</i>	Sieke, Seifert, and Thonemann (2012)	The paper looks into how the supplier responds to the contracts and how the contract limitations can be chosen.
Human resource related	<i>Job satisfaction, human resource in supply chain, person-organization fit</i>	Maloni et al. (2017)	Job satisfaction and industry commitments are impacted differently across workforce levels in supply chain.
	<i>Pharmaceutical supply chain, service level, social responsibility</i>	Nematollahi, Hosseini-Motlagh, and Heydari (2017)	The paper finds that collaborative decision-making on visit interval and service level could be beneficial, socially and economically.
	<i>Healthcare supply chain coordination, integration</i>	Mandal and Jha (2017)	The paper identifies that collaboration planning, execution and decision-making in hospitals and suppliers in healthcare enhance operational performance.
	<i>Energy efficiency, retrofitting, stakeholder theory, environment</i>	Genovese, Koh, and Acquaye (2013)	The paper identified three ideal types of supply chain configurations based on the size and scope of energy efficiency.
Environmental friendly practice	<i>Environmental performance evaluation, grey MCDM approach</i>	Chithambaranathan et al. (2015)	A grey-based hybrid agenda for evaluating the ecological performance of service supply chains is projected by integrating grey-based techniques with ELECTRE and VIKOR tactics.
	<i>Resource efficiency, service delivery system, services management, eco-friendly service concept, service coproduction, signalling effect</i>	Zhang, Joglekar, and Verma (2014)	The paper indicates that dependable eco-certifications achieve the signalling effect.
	<i>Marketing mix, customer satisfaction</i>	Keller et al. (2006)	A positive linkage is found between the internal marketing mix and internal customer performance in service supply chains.
	<i>Service industries, supply chain management</i>	Sampson (2000)	A customer-supplier duality is discovered as it pertains to service supply chain management, including practical and administrative implications.
Customer satisfaction related	<i>After-sales service, uncertainty, Game Theory, marketing–operations interface</i>	Kurata and Nam (2013)	The paper finds out a firm's effort to provide efficient service operations will increase the chance of accidental out performance.
	<i>Service quality coordination, online supply chain, Game Theory</i>	Qin et al. (2017)	This paper proposes two models, which consider individual rationality and fairness preferences of members and designs coordination contracts in a decentralized online shopping service supply chain.

	<i>Money back guarantee service, dual-buy back contract</i>	Heydari, Choi, and Radkhah (2017)	The paper suggests that using the buyback contract alone for unsold items cannot achieve Pareto improving supply chain coordination, whereas the dual-buy contract can.
	<i>Service supply chains, triads, industrial services, manufacturing industries,</i>	Finne and Holmström (2013)	The paper creates a triadic operational model with an integrator and end user. The subsystem suppliers can servitize within a supply chain in which the end user relationship is controlled by the integrator.
	<i>Risk attitude combination, quality control and coordination, Nash equilibrium</i>	Liu and Wang (2015)	The paper suggests that the level of risk attitude of LSI should not be unlimited and an interval exists for FLSP.
Others	<i>Implicit shift scheduling, column generation, rostering, postal operations, branch and price</i>	Brunner and Bard (2013)	The paper finds out the necessary staffing levels for different worker categories subject to a host of union restrictions and general labour regulations.
	<i>Driver scheduling, public transport</i>	Wren et al. (2003)	The paper creates a mathematical model to efficiently use drivers in public transport system.
	<i>Quality coordination, mixed Nash equilibrium</i>	Liu, Xie, and Xu (2013)	The paper finds out under multi-period collaboration circumstances, the LSI tends to make rapid choices when retribution intensity is below the critical value.
	<i>Logistics service supply chain, order insertion scheduling</i>	Liu, Zhao, et al. (2017b)	In the context of mass customization logistics service, the customer order decoupling point shows that the location of the customer order decoupling point moves earlier with the increase of the volume of new order.
	<i>Supply chain integration, Contingency Theory</i>	Yuen et al. (2017)	The paper presents a contingency theory that specifies and contrasts the interrelationships between internal integration and external integration on operational performance of product and service supply chains.

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