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ORIGINAL ARTICLE

The evolution of service systems to service ecosystems: A literature review

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Abstract

High academic interest and numerous theoretical and practical studies on service systems and service ecosystems, paired with the accelerated evolution of the service (eco) system concept, have resulted in complex research in this field. Multiple perspectives from which service systems were studied added to this complexity and inadvertently produced conceptual confusion regarding service (eco) systems. This literature review addresses this confusion by focusing on the evolution of service systems to service ecosystems to consolidate and clarify the field. Therefore, this article's purpose is to systematise the extant research on service (eco) systems and indicate future research directions based on the analysis. Specifically, the article systematically reviews 770 publications on service (eco) systems from 2020 and earlier and identifies the main research topics (focusing on service [eco] systems' constituent elements, inherent processes, and outcomes), theoretical perspectives, and bridging elements, and suggests future research based on the review results. The article concludes by providing a foundation for continued research emerging from the analysis, with emphasis on five aspects that may stimulate new avenues of research: service ecospheres, service ecosystem simplicity, failures of service ecosystems, paradox in service ecosystems, and panarchy and service ecosystems.

INTRODUCTION

Over the past several decades, we have seen an evolution from service systems – infrastructures combining different constituencies, such as customers, employees, technology, the business environment, and organizations in space and time, offering service quality as the outcome via processes such as service delivery and service innovation (Edvardsson, 1997) – towards service ecosystems, sets of social and economic actors in a context shaped by institutions, with actor-to-actor structures continuously re-created for mutual value creation (Vargo & Lusch, 2016).

This development has not necessarily occurred in a sequential manner and it has occurred in various related disciplines and from multiple perspectives (Badinelli et al., 2012). For example, service management-related research tends to focus on issues of service quality outputs of service systems (Edvardsson, 1997), while service science merges research in systems engineering, information technology (IT), economics, management, and business (Polese et al., 2019), and service-dominant logic (SDL) conceptualizes

TABLE 1 Illustration of the evolution of service systems to service ecosystems

Representative examples	*Perspectives*	*Conceptualizations/Definitions*
Prahalad and Hamel (1990)	Marketing management	Services and service systems as means of adding value and increasing a firm's growth
Edvardsson (1997)	Service systems as service firms	Service system as a set of resources within the firm, available to realize the service
Voss (2000)	Relationships	Service system as a set of relationships and a context in which interactions aimed at delivering service are taking place
Maglio and Spohrer (2008)	Service science	Service systems are value-co-creation configurations of people, technology, value propositions connecting internal and external service systems, and shared information (e.g., language, laws, measures, and methods)
Ng et al. (2012)	SDL	A service system is a network of agents and interactions that integrate resources for value co-creation
Vargo and Lusch (2016)	SDL	A service ecosystem is a relatively self-contained, self-adjusting system of resource-integrating actors connected by shared institutional arrangements and mutual value creation through service exchange

service systems and service ecosystems from a marketing perspective (Vargo & Lusch, 2016), infusing it with sociological theories (Edvardsson et al., 2011b).

Thus, the view on service systems shifted from considering them as means of adding value to viewing them as service firms, and conceptualizing them as sets of relationships. This increased importance of relationships and interactions (Voss, 2000) and the widening of service systems perspective (Akaka et al., 2012) due to the expansion of business boundaries beyond a single firm to an interconnected set of actors (Sawatani, 2019) led to the conceptualization of service systems evolving into service ecosystems. Consequently, research on service systems and service ecosystems has become more entrenched in SDL (Mustak & Plé, 2020). Table 1 illustrates the evolution of service systems to service ecosystems, noting that the extant research converges in service ecosystems as 'systems of service systems' (Vargo & Akaka, 2012). Service systems to service ecosystem evolution can also be observed in more recent publications, for example, in aligning service design with service ecosystems (Vink et al., 2021).

This evolutionary development was described as 'accelerated', and as related research was mostly concerned with concepts, theories, and frameworks, it led to a certain amount of confusion about the elements of service systems and service ecosystems (Mustak & Plé, 2020), resulting in overlaps between their constituencies, processes, and outcomes (Sawatani, 2019). For example, service systems and service ecosystems are occasionally used interchangeably (Atiq et al., 2017; Ciasullo et al., 2017). There is confusion regarding the relationships among service systems, service ecosystems, and business ecosystems (Anke et al., 2020). Furthermore, service ecosystems have been confused with networks (McColl-Kennedy et al., 2012) and understood from different theoretical positions (Adner, 2017; Autio & Thomas, 2020). The confusion is even more pronounced as service systems continue to be reframed in novel ways, such as smart service systems (Han & Park, 2019), healthcare service systems (Anderson et al., 2019), human-centred service systems (Huetten et al., 2019), and public service systems (Eriksson et al., 2020).

To address this confusion so that the field can move forward (Polese et al., 2019) and in this manner offer a springboard for further theoretical and empirical studies (Gourlay, 2006; Honjo, 2000; Schutjens & Wever, 2000), our review responds to calls to clarify the essence of service systems vis-à-vis service ecosystems (Frost & Lyons, 2017; Frost et al., 2019) and consequently consolidate the field. Thus, this article's purpose is to systematize the extant research on service (eco) systems and indicate future research directions based on the analysis. Specifically, the article systematically reviews the literature on service (eco) systems, identifies the main research topics (focusing on service [eco] systems' constituent elements, inherent processes, and outcomes), theoretical perspectives, and bridging elements, and suggests future research based on the review results.

This study makes several contributions to the literature. First, it helps consolidate the literature on service (eco) systems. Second, by tracing the evolution of extant research on service systems, this study provides a foundation for continued research. Third, it provides future research recommendations, with the analysis findings as the starting point. Fourth, it applies the work of Light and Pillemer (1984), which is widely used in fields such as medicine (Lau et al., 1997) and for more complex literature reviews and analyses (Hox et al., 2017), yet rarely applied in management studies.

The remainder of this paper is organized as follows. First, the method section explains the scope and coverage of the literature review and the analysis process of the relevant literature. Next, the findings of the literature review trace the evolution of the field of service systems to service ecosystems in three stages. The constituencies, processes, and outcomes of each group, and theoretical perspectives and publications representing conceptual bridges between the groups, are presented. Finally, the article presents the conclusions and an extensive overview of future research directions.

METHOD

Identifying relevant publications concerning service systems and service ecosystems was the first step in this literature review. We conducted systematic searches of the databases Business Source Premier, Emerald, JSTOR, Scopus, and Wiley using the search keywords *service system(s)* and *service ecosystem(s)*, focusing on titles, abstracts, and/or article keywords. This search strategy enabled us to capture relevant publications in a broad manner while simultaneously minimising the possibility of overlooking important articles.

We excluded literature pertaining to fields other than business economics, management, economics, and finance and addressing similar related constructs, such as business (service) networks (Holmqvist & Diaz-Ruiz, 2017), product–service systems (PSS; Adrodegari & Saccani, 2017; Boehm & Thomas, 2013; Haase et al., 2017; Reim et al., 2015), service operations management (Victorino et al., 2018), and service system optimisation. We considered these independent literature streams with their own particular discourses and recent extensive literature reviews as we have indicated. Our list contained 770 publications and included 701 peer-reviewed articles, 62 book chapters, and seven books, all published in 2020 or earlier. We excluded working papers and conference papers, assuming that most would later appear as articles or book chapters.

Next, we analysed the literature. Inspired by previous literature reviews tracing the evolution of service management (Fisk et al., 1993; Moussa & Touzani, 2010) and service innovation (Carlborg et al., 2014), we focused on the elements that prompted the evolution of service systems to service ecosystems. Consequently, we devised an analytical framework derived from the frameworks of these previous reviews. The categories comprising the analytical framework that we used to scrutinise our data set were the topics, theoretical perspectives, conceptualisations of service (eco) systems, and reported contribution(s).

We began the analysis process with a preliminary analysis, wherein we analysed 50 articles on service systems and 50 on service ecosystems. The authors divided these 100 articles and analysed them independently of each other using the aforementioned analytical framework. After this preliminary analysis, the authors exchanged the assigned publications and analysed each other's publications following the same categories. They then compared the results and resolved disagreements through discussion to attain a shared perspective and thus facilitate further analysis. The preliminary analysis showed that the topic category needed refinement; thus, we developed subcategory constituencies, processes, and outcomes to optimally portray the elements of the evolutionary advances in the literature.

The next step involved analysing the remaining publications. We followed four guidelines from Light and Pillemer's (1984) seminal methodological work on conducting systematic literature reviews. Table 2 presents the principles, means, and aims with which they were applied. Moreover, following Light and Pillemer (1984), we exploited disagreements among the findings, or more concretely, deviations from the dominating conceptualizations of service systems, to indicate how service systems evolved into service ecosystems via bridging publications. The authors held regular progress report meetings, informing each other on the course of the analysis, presenting preliminary results, discussing possible discrepancies, and resolving possible problems, to make the analysis more homogenous.

Some discrepancies between the authors' analyses were identified but were deemed non-substantial for the final results and resolved through additional discussions. The aim of the preliminary analysis and regular progress report meetings was to compare ideas, reduce bias, continuously shape and re-shape the results, and discuss potential disagreements to consolidate the results. Moreover, this form of organizing the analysis process reflects Light and Pillemer's (1984) fourth principle of rigorous yet flexible reviewing, which allowed the authors to adapt their mutual understanding and obtain the results during the analysis.

The analysis revealed that the publications could be classified into three groups based on how the service system conceptualization evolved: (1) service systems in service management, (2) service systems as value constellations, and (3) service ecosystems. The conceptualisation category of the framework, paired with service system constituencies, processes, and outcomes, guided the decision regarding how to classify a specific publication. Consequently, publications in the first group conceptualized service systems from three distinct yet related perspectives: marketing management, service firms, and relationships. All are part of the traditional service management domain, with

TABLE 2 Application of Light and Pillemer's (1984) principles in the review

Light and Pillemer's (1984) principles	Application in this review	Aim(s)
The reviewing strategy and review structure must be guided by the purpose.	The article's purpose is to systematise the extant research on service (eco) systems and indicate future research directions based on the analysis. The review's extended purpose is to systematically review the literature on service (eco) systems, identify the main research topics (focusing on service [eco] systems' constituent elements, inherent processes, and outcomes), perspectives, and bridging elements, and suggest future research based on the review results. The purpose guided the reviewing strategy and structured the review process by anchoring the review around constituencies, processes, and outcomes of service systems, as well as perspectives and conceptualisations of service systems, and the reported contributions of the analysed articles.	To organise, structure, operationalize, and shape the review process
Disagreements among findings are valuable and should be exploited.	The analysis revealed that some articles fell between the main groups, combined several conceptualizations of service systems, offered an alternative view to a certain perspective, or simply did not fit within the groups. These disagreements were exploited to reveal the bridges between the main evolutionary developments in the field and indicate alternative views to the dominant perspectives within those developments.	To indicate bridges in the service systems and service ecosystems literature and to acknowledge the variety within its main groups
Both quantitative and qualitative information play key roles.	Each group is presented in quantitative terms, for example, breakdowns of publications in findings, and qualitative terms, for example, insights regarding constituent elements, inherent processes, outcomes, and theoretical perspectives within each group.	To offer a more comprehensive view of service system development and service ecosystem literature by presenting quantitative and qualitative results in a complementary fashion
Statistical precision cannot replace conceptual clarity; systematic reviews must be rigorous yet flexible enough to adapt to the circumstances of the review process.	The review process was organised in a rigorous manner yet allowed for flexibility via the authors' discussions of these aspects.	To achieve a joint perspective between the authors to facilitate the analysis process and consolidate the results

the firm/organisation as the focal point. Publications in the second group reveal more contemporary approaches to service systems as value constellations, framed in two theoretical perspectives: service science and SDL. According to this conceptualisation, they aim to create value via value propositions. Value and complexity reflect the inner nature of such systems. The outcome of service systems as value constellations is value creation, achieved through multiple interactions among actors. Publications in the third group considered service ecosystems through an SDL lens. Service ecosystems are socio-economical contexts shaped by institutions and favour collaborative value co-creation via relationships and resource integration.

One challenge was the complexity of the field of service systems, epitomized in the variety of perspectives indicated in the introduction and subsequently identified through the analysis. In one case, some scholars would nominally use the service system concept claiming to do so from the outsets of one perspective while actually discussing another competing or succeeding perspective. Normann's (2000) book on service management elaborates the service management system of a service firm operating within

value constellations. Another case is the concept of the service system being used in different ways in different service research fields. For example, service management focuses on issues of service quality (Edvardsson, 1997), while service science has attracted research from multiple disciplines ranging from systems engineering and IT/IS to different fields of economics, management, and business (Polese et al., 2019), while SDL focused on developing the conceptualization of social (eco) systems based primarily on sociological theories (Edvardsson et al., 2011b). We interpret these challenges as consequences of the accelerated evolution of the conceptualisation of service systems to service ecosystems, as indicated by Mustak and Plé (2020).

To overcome these challenges, we employed two strategies. First, during the preliminary analysis and concomitant progress report meetings, we understood that the primary focus across the conceptualisations and perspectives was value, under its varying labels (e.g., service quality, value creation, value co-creation). Consequently, another common denominator among the perspectives was the common quest for constituencies, processes, and outcomes of service (eco) systems. We centred our review on these commonalities, but we simultaneously had in mind different perspectives and differences among the conceptualizations of service (eco) systems. This led us to the second strategy: we were guided by Light and Pillemer's (1984) second principle regarding disagreements (Table 2). We understood that publications fitting between or portraying two perspectives functioned as transitions between two certain conceptualizations, and we labelled them *bridging publications* because, in our analysis, they epitomised bridges in the development between two particular conceptualisations of service systems and service ecosystems. Figure 1 illustrates these transitions. Other divergent results are addressed in the Results section.

Next, for each group, we first present a breakdown with the main findings, followed by the constituencies, processes, outcomes, perspectives, and bridging elements leading to the next group. Thus, per Light and Pillemer's (1984) principle, both quantitative and qualitative information are presented complementarily for a comprehensive understanding of developments in service systems and service ecosystems literature.

FROM SERVICE SYSTEMS TO SERVICE ECOSYSTEMS

The analysis of service systems identified three groups in the evolution from service systems to service ecosystems: (1) service systems in service management, (2) service systems as value constellations, and (3) service

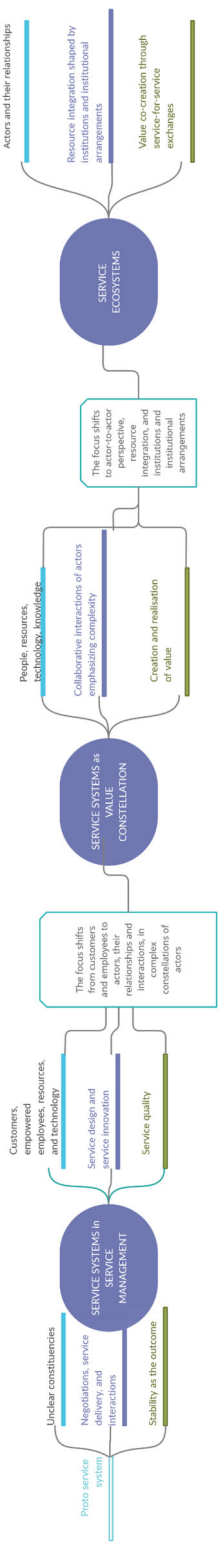

FIGURE 1 The evolution of service systems to service ecosystems through constituencies, processes, and outcomes [Colour figure can be viewed at wileyonlinelibrary.com]

ecosystems. The following sub-sections present each group's constituencies, processes, and outcomes and the main theoretical perspectives and bridging publications between the groups.

Group 1: Service systems in service management

The first identified group comprises 149 publications, 62 conceptual, and 87 empirical. However, prior to this group, the analysis identified publications that can be considered antecedents of service systems, that is, *proto-service systems*. Alderson (2009) developed a functional theory of marketing and conceptualized organized behaviour systems, which engage in negotiations and continuously adjust to their unstable environment to sustain self-stability. Regan (1963) claimed that services and service systems add value to firms and increase competitive advantage. Consequently, these proto-service systems were embedded in market segments and exhibited via service delivery, with firms interacting with the business environment. Negotiations, service delivery, and interactions with the environment are the processes and stability is the outcome. However, less can be interpreted regarding constituencies. These proto-service systems planted seeds for future service system development in service management by linking service systems to marketing management, service delivery, and relationships at the proto-level and conceptualizing the firm as a system embedded in its environment.

Research on service systems has become more constant since the 1980s. Most articles in Group 1 understand *service systems in service management* as infrastructure combining constituencies, such as actors, technology, the environment, and organizations in space and time, to offer service quality as the outcome via processes such as service delivery and service innovation.

Service system constituencies in service management

The analysis indicated that scholars mainly considered service system constituencies and their optimal combination, leading to favourable outcomes. For example, for Edvardsson (1997), a service system is a set of subsystems, namely, customers, the organization's structure and system, management and staff, and physical and technical resources. Tansik (1990) and Grönroos (1998) emphasize customers' crucial role in service systems. Grönroos also stressed the support of the service system (systems support, management support, and physical support) driven by service concepts. For Kandampully and Duddy (2001), a service system is the coordination between employees' empowerment to make independent decisions beneficial to the customer and the firm, service guarantees, and service recovery strategies.

Other publications contain the constituencies mentioned above. The service system as a set of components that provide services around a product has two key features: product and personnel (Samli & Kosenko, 1982). Personnel, processes, and physical facilities constitute another combination of features (Stuart, 1998; Tax & Stuart, 1997). A service system was defined as a context hosting the interactions (Gupta & Torkzadeh, 1988) within which customers should be trained (Voss, 2000). Technology was also a frequently cited feature (Fisk, 1999; Voss, 2000). Luk et al. (2013) highlighted service delivery and service recovery as crucial to service systems in service management along with technology, stressing that more research is needed to understand how the development of employees' skills increases service quality.

The most frequently mentioned constituencies of service systems in service management were the customers (Grönroos, 1998; Kandampully & Duddy, 2001). This was followed by independent and empowered employees, the service concept(s), the organization as support, and other resources, such as technology. Scholars emphasized the interconnections among these elements (Cho & Menor, 2010) when describing a service system as a dynamic configuration of service encounters, elements of a firm's strategy, quality dimensions, design, and service delivery.

Processes in service systems in service management

Consequently, discussions regarding service system constituencies in service management led to explorations of service system processes, primarily how their combinations can lead to optimal outputs in the form of service quality. Research has addressed the most effective service systems' development and design, with a focus on service-delivering firms' effective functioning (Chase, 1978). Service design issues were mentioned by Shostack (1987), who understood service systems as internal systems of a firm's processes, services, and service delivery and used blueprints to illustrate them. Gupta and Torkzadeh (1988) targeted service system re-design through knowledge management and analysis of customers' needs and activities toward an improved combination of effectiveness and efficiency.

Further, according to the analysis, service systems' relevance has been highlighted in relation to other processes, such as service innovation. Edvardsson and Olsson (1996) suggested that service innovation includes the

development of a service concept (i.e., which customer needs are satisfied), a service system (i.e., the resources necessary to deliver a service), a service process (Riedl et al., 2011), and service-oriented competition (Desyllas et al., 2018). Tax and Stuart (1997) highlighted the relationships among services' three key design dimensions (processes, participants, and physical facilities) and how they must be jointly considered to effectively plan a new service system. Stuart (1998) emphasised that new services must be aligned with existing service systems.

Outputs of service systems in service management

Finally, service quality as the output of service systems was explored. Edvardsson's (1997) seminal article focusing on service quality is an example of intertwining service systems, service quality, and service design, illuminating service systems' features and reframing value creation. His conceptualisation of a service system remains influential today (used in Kowalkowski et al., 2011; Kowalkowski & Witell, 2020). Service systems and service quality were also discussed and linked to and via total quality management (TQM; Lakhe & Mohanty, 1994), SERVQUAL (Jensen & Markland, 1996), the service quality information system (Berry & Parasuraman, 1997), and the setting of ISO standards (Karapetrovic, 1999).

Additionally, opposed to these dominant topics of interest, the analysis revealed several under-researched topics within this group. Few articles considered service systems in relation to well-established business topics, such as service recovery (Kandampully & Duddy, 2001), customer experience (Soman & Zhou, 2002), internal marketing (Suh et al., 2011), service personalisation (Glushko & Nomorosa, 2013), and servicescape (Ellway, 2014). Recently, publications exploring service systems in the context of new technologies such as the Internet of Things (IoT; Tuan et al., 2019) have begun to appear.

Theoretical perspectives on service systems in service management

We identified three distinct perspectives on service systems in this group. The first views service systems through marketing management. Gupta and Torkzadeh (1988) stressed differentiation strategies pertaining to service systems. Furthermore, the contribution of services and service systems to business results and growth has been discussed (Prahalad & Hamel, 1990). Some recent studies still follow this perspective, confirming their practical and applied value – Tavakoli et al. (2016) discussed service quality in an after-sales context, while Bodey et al. (2017) examined a franchising service system.

Publications within the second perspective understand service systems as services firms, such as engineering firms (Lakhe & Mohanty, 1994), hospitality and tourism firms (Kandampully & Duddy, 2001), and public services (Osborne et al., 2015). Thus, service systems were treated as service firms, service delivery systems, or service management systems. Finally, a strong relational perspective was identified. This perspective emphasizes interactions, customer involvement, and the role of skilled and trained personnel in delivering services to customers. Martin et al. (1985) understood the service system as a set of relations aimed at service provision. Smith (1996) suggested that communication with customers should be used to improve the treatment of uncertainty in service design. Additionally, Glushko and Nomorosa (2013) re-evaluated interactions as information regarding service encounters, service system design, and technology usage.

Publications bridging service systems in service management and service systems as value constellations

Some researchers have laid the groundwork for the evolution of the field in general and for service systems in particular by indicating a number of transformations that transitioned the conceptualization of service systems in service management to service systems as value constellations. Kingman-Brundage et al. (1995), with their service logic, emphasized service focus and value creation, linking them to service systems and service delivery design. In effect, they started the shift of focus from service quality to value and value creation as the output of service systems. Moreover, as the need to reframe the understanding of service systems to a more dynamic view was expressed (Fisk, 1999), leading to the notion of the complexity of service systems, Normann (2000) placed the firm at the centre of such a dynamic value constellation and explained that a service management system comprised market segments, that is, the customer types, service concept (benefits offered), service delivery system, and image, culture, and philosophy of the firm. Normann and Ramírez (1993) and Normann (2000) focused on service systems from the value creation perspective and regarded service systems as innovative linkages between human capacities. They de facto shifted the focus from customers and employees to actors and their relationships and interactions as the main constituencies and processes of service systems, laying the ground for service science and SDL to explore and refine these notions. This transition can also be observed from the perspective of service systems in service

management, which shifted from viewing service systems within marketing management to viewing them as service firms, to finally conceptualise service systems as sets of relationships.

Having outlined the transitional ideas and established the foundation for the next evolutionary period, this review next relays the research of service systems as value constellations.

Group 2: Service systems as value constellations

The second group consists of 207 entries, with a predominance of conceptual contributions (120) over empirical ones (87). Most publications in this group depicted service systems as value constellations, that is, complex sets of actors exchanging resources aimed at offering value to customers. Group 2 emerged from the transformative conceptualizations of service systems in, for example, Norman and Ramírez (1993) and Fisk (1999), which were absorbed with SDL and, consequently, service science, infusing them and expanding upon them with notions from systems theory. Per this view, value constellations are complex service systems, viable service systems, and smart service systems. SDL regards service systems as constellations favouring value co-creation using resource integration and interactions, while service science describes service systems as a set of elements supporting value co-creation and engaging in continuous exchanges with other service systems.

The main constituencies used to describe a service system according to this conceptualization are actors (people, providers, clients, etc.) and resources (e.g., information, knowledge, and technology), whereas resource integration is the most relevant process and outcome value. Moreover, the conceptualization of service systems in this group is more holistic and dynamic. They are not a mere sum of the above parts; their complex and rational combination aims to create value. Plé and Chumpitaz-Cáceres (2010) defined service systems as configurations of resources linked to other systems by value propositions. Moreover, the constituencies of a service system can enable value co-creation by interacting with other service systems to exchange resources and knowledge and shape value propositions (Bithas et al., 2018).

Constituencies of service systems as value constellations

In this group, actors and resources are the main constituents, although this may be an oversimplification because, per this perspective, service systems arise from the intricate relationships and interactions among the constituencies, resulting in value as the outcome. Here, service systems are understood as configurations of people and technology achieving value co-creation (Vargo et al., 2008) and have been defined as 'complex systems in which specific arrangements of people and technologies take actions that provide value for others' (Ng et al., 2011, p. 14). Actors in a service system can be, for example, the service user, the buyer, and the provider (Daim et al., 2010). However, the authors recognised the need to expand their views from actors to other constituencies, such as people and technology. This set of constituencies expands on the previous understanding that Spohrer et al. (2007) proposed: people, technology, and service systems are linked through value propositions and shared information.

The analysis revealed knowledge and technologies as particularly sophisticated resources helping actors in their catalytic processes toward value as the outcome. For example, Maglio and Spohrer (2008) highlighted information and knowledge as the processes' main components leading to value and service innovation. Maglio et al. (2009) clarified the role of service systems in creating value through both operand and operant resources, the nature of service systems, and the methods and mechanisms enabling a service system's workability. Operand resources are those on which an act or operation is performed, while operant are those that act on other resources (Vargo & Lusch, 2004), and the service systems view enhanced by SDL requires marketing to focus on the latter (Madhavaram & Hunt, 2008).

Technology emerged as a constituency supporting service system processes, enabling multiple actors to collaborate more smoothly beyond dyadic relationships characterizing service systems in service management. Mogre et al. (2009) focused on the role of technology because it connects people and value propositions. Trischler and Charles (2018) referred to technology's support for value co-creation in service systems. They proposed that 'technology contributes to the co-creation of value by enabling the sharing of information within and across service systems' (Trischler & Charles, 2018, p. 25). Recently, research conceptualizing *smart service systems* (Beverungen et al., 2019), in which technology plays a crucial role, has been drastically expanding. Technology in such systems enables interactions among multiple actors and favours the implementation of individualised value propositions, thus facilitating value co-creation. On the other hand, some researchers discuss instead human-centred service systems (Huetten et al., 2019), such as hospitals, dominated by human behaviour, human cognition, and human emotions (Maglio et al., 2015).

Processes in service systems as value constellations

Resources, people, and knowledge interact collaboratively to achieve value as an outcome of service systems (Barile & Polese, 2010). These processes are a form of intricate dynamics among resources, actors, contexts, and other constituencies involved in resource integration as a participative process that emphasises complexity, adaptability, and flexibility as inherent in service systems as value constellations. Ng and Andreu (2012) claimed that complexity arises in a service system consisting of interactions and connections among individuals, institutions, processes, and practices. Anderson et al. (2016) stressed the centrality of resource integration through the idea of responsibility-permeating actors, the structural tensions of resource integration, and resource integration practices.

Complexity is inherent in service systems because of its dynamic nature (Badinelli et al., 2012) and the combined effect of value co-creation, experiences, and actors' participation in interactions and resource integration (Åkesson et al., 2014). Complexity vis-à-vis resource integration depends not just on the number of actors and factors taking part in value propositions but also, because of their variety, on the intricacy of relationships and dynamics featuring both the context and interactions. Service system complexity has also been investigated empirically (Sangiorgi et al., 2019), emphasising the role of collaboration and flexibility in service system transformation.

The analysis of service systems moved towards complexity when authors (e.g., Barile & Polese, 2010) combined the viable system approach (VSA) and SDL. Subsequently, complexity emerged as relevant because of the substantial number of actors and the dynamics of their interactions and relationships involved in resource integration and creation of sustainable value propositions (Patricio et al., 2011). The adaptability and flexibility of these processes are particularly important for resource integration and value proposition formation (Krishna & Lelescu, 2011) as no actor can provide service alone and all actors should profit from service system participation (Tan et al., 2011). However, despite the emphasis on their relevance, more research into service systems' adaptability and flexibility has been sought (Ostrom et al., 2015).

Identified as a process in the previous group (service systems in service management), service innovation was reframed to include the multi-actor perspective, collaborative view, and resource integration complexities. Paton and McLaughlin (2008) combined innovation and service science by balancing the importance of innovation and service exchange. Perks et al. (2012) framed innovation in SDL when considering service system configuration as fertile ground, leading innovation to contribute to value co-creation. Research interest in service innovation as an aspect of service systems is increasing (Feldmann et al., 2019; Sangiorgi et al., 2019).

Outcomes of service systems as value constellations

Value has been deemed the ultimate outcome of processes in service systems as value constellations. Per this view, value creation is at the core of service systems' existence. Consequently, system outcomes are collaborative, and the value created is higher than the sum of the value that each part can create (Ng & Andreu, 2012). Frost and Lyons (2017) emphasized that the combination of components leads to successful service systems, namely, responding to changes depending on actors and their interactions. The authors also highlighted that more understanding is needed regarding various combinations' potential effects on outcomes.

A value-based service system combines and orientates people, resources, and knowledge toward the value creation of and for the actors involved in the service system. The orientation toward value co-creation shapes a service system (Maglio & Spohrer, 2008), and its constituencies and processes are necessary to realise value in the system (Vargo et al., 2008). Value as an outcome is also observable in customer experiences, as they are affected by a service system's proper management (Edvardsson et al., 2011a) and can be more flexibly designed because customers join the co-creation of experiences (Patricio et al., 2011), and by service experiences, which are always co-created in a service system (Edvardsson et al., 2013). Gil Saura et al. (2005) observed additional effects of realised value, such as employee satisfaction, learning consequences for both employees and customers (i.e., actors), and the setting of communication standards, potentially improving future interactions and resource integration.

Finally, Vargo and Akaka (2009) delineated value creation as the outcome of the interaction of multiple service systems, as no individual or pair of service systems sufficiently depicts value emergence from the perspective of mutual value creation. This conceptualisation of value as the outcome of interactions between service systems leads to publications bridging service systems as value constellations and service ecosystems, the latter frequently conceptualised as 'systems of service systems' (Vargo & Akaka, 2012).

Theoretical perspectives on service systems as value constellations

The analysis recognized two perspectives in this group: SDL and service science. They occasionally overlap because of some of their commonalities and their cross-pollination (López et al., 2011), but most publications focus on one perspective. Essentially, although service science attracted scientists from many cultural domains willing to contribute to service-centred phenomena research (Polese et al., 2019), and SDL developed primarily from marketing studies (Go Jefferies et al., 2019), both sought more understanding of service systems' constituencies, processes, and outcomes.

Service science has dominated the debate since 2007 and inspired advances in SDL; the first articles on service systems from the SDL perspective lie somewhere between service science and SDL (Maglio & Spohrer, 2008). Service science describes service systems according to the depiction of evolutionary contexts, shaped by multiple actors operating through technology as part of continuously changing settings where value is created. This view, dependent on Spohrer et al. (2007), is recalled by scholars focusing on service systems' dynamic configuration (Maglio et al., 2009), the joint service provision highlighting the roles of providers, customers, and other actors (Daim et al., 2010) and identifying the consequences of setting customer experience (Edvardsson et al., 2011a), thus permeating the marketing debate as well.

The SDL perspective shifts from the assumption that firms seek effective and efficient ways to provide services (Ng et al., 2012), but further advances are proposed when considering the combination of multiple offerings in service constellations, constituting the essence of service systems themselves (Pinho et al., 2014). This combination led scholars beyond the dyad, highlighting triadic value propositions, with resource integration and value alignment as essential mechanisms to achieve value co-creation (Kowalkowski et al., 2016).

Publications bridging service systems as value constellations and service ecosystems

Some publications we analysed anticipated or inspired advances leading the development from service systems to service ecosystems. Some examples of these 32 bridging contributions included Akaka et al. (2012), who argued for widening the service system perspective due to the B2C to actor-to-actor transition, and McColl-Kennedy et al. (2012), who questioned why scholars used *network* and *ecosystem* almost interchangeably and emphasized the advantages of the ecosystem conceptualization. As in the previous bridge, publications identified between service systems as value constellations and service ecosystems offered transformations of some concepts, driving the evolution to the next stage. In addition to Akaka et al. (2012) and actor-to-actor exchange pivoting around value, Mars et al. (2012) demonstrated why using the ecosystem metaphor is beneficial for service research, leaning toward complexity. This shift revolving around complexity was also pronounced in Barile et al. (2016) work, which proposed a perspective based on a multi-level analysis consisting of service systems, networked service systems, and service ecosystems. The centrality of value propositions in service systems as value constellations shifted to resource integration and a stronger focus on institutions and institutional arrangements (Frow et al., 2014). These articles jointly emphasize that service ecosystems as an emerging metaphor are more suitable for showing actors' changing roles in service systems and emphasising such complex systems' dynamics.

Group 3: Service ecosystems

Group 3 consisted of 352 publications, with conceptual publications representing a slight majority (180). Most (62%) of this group's publications were published in 2020. Per this conceptualization, a service ecosystem is a set of social and economic actors in a context shaped by institutions, with actor-to-actor structures continuously recreated for mutual value creation. Most of this group's publications are framed within SDL, as the authors described actors as service systems' main constituent elements; their relationships, resource integration, service exchange, and institutions and institutional arrangements as ecosystems' inherent processes; and value (co-creation) as the outcome. However, more recently, even service science reframed its main postulates to the service ecosystems conceptualization (Maglio et al., 2019).

Service ecosystem literature development accelerated beginning with Vargo and Lusch's (2010) first mention of the concept. The most recurring debates in this group revolved around actors and their relationships as service ecosystems' constituencies, resource integration as the process shaped by institutions, and value creation as the outcome. These debates contributed to the more general SDL discourse and were recognized in Vargo and Lusch's (2016) definition of service ecosystems as relatively self-contained, self-adjusting systems of resource-integrating actors connected by shared institutional arrangements and mutual value creation through service exchange.

Constituencies of service ecosystems

Actors in service ecosystems and their relationships, both in the traditional B2C approach in marketing studies (Blomberg, 2008) and as a network of relationships and social interactions supporting collaborative value co-creation (Merz et al., 2009), can be considered service ecosystems' constituencies. Moreover, SDL's influence corroborated a more detailed focus on relationships because a service ecosystem allows for the dynamic observation of relationships, even when considering complexity and the time-based perspective, as both challenge the static conceptualization of a service ecosystem (Ben Letaifa & Reynoso, 2015). The focus on relationships highlights service ecosystem dynamics because actors' roles can change. Westrup (2018) illuminated such a change in determining public service provision's main features and claiming that citizens should not always be considered the user or the staff of local agencies as providers. Based on the same assumption, Helkkula et al. (2018) identified actors' various and changing roles in a service ecosystem and noted that every actor can contribute to service innovation. When the roles of actors change, they stimulate other changes, shaping markets in a new way (Kaartemo et al., 2020), thus leading to new interplays within the service ecosystem.

The consideration of actors and their relationships progressed to include actor-to-actor or service-to-service or was generally based on cooperation and exchange. Lusch and Nambisan (2015) adopted the actor-to-actor approach, and these relationships' structure was the service ecosystem. Focusing on this perspective requires additional focus on engagement as a descriptor of the intensity of every actor's effort (Finsterwalder, 2017). Engagement is relevant because it affects actors' interactions and integration of resources, as Röndell et al. (2016) proposed when stating that co-creation activities are strongly dependent on customer engagement. Pelletier and Cloutier (2019) investigated the adoption of digital transformation in small firms' B2C relationships, determining that technologies increased relationship intricacy and led to the need to focus more on human skills, financial resources, and organisational capabilities supporting successful decision-making. Pandey et al. (2020) identified the possibilities of digital technologies in B2B marketing and suggested focusing on the sales team and available resources to maximize these technologies' use.

Processes in service ecosystems

The resource integration process is the key process occurring within service ecosystems and is shaped by institutions and institutional arrangements. Lusch et al. (2016) emphasized resource integration regarding service-for-service exchanges between actors in a service ecosystem; this notion has been more recently applied in the context of cities (Cassidy & Resnick, 2020), stressing collaborations' role in a 'community hub' supporting retailers. Peters (2019) observed resource integration from a service ecosystem perspective, advocating that resource-integrating actors collectively contribute to service ecosystem development. Due to value's social nature, norms are needed, leading to the necessity of monitoring and control. The authors proposed two other considerations: (1) a service ecosystem's dynamics are useful in depicting actors as the holders of resources needed to achieve value and (2) value emerges in points different from that hosting the exchange due to the notion of value-in-use, leading to further expansion of the context's dynamics. Lusch et al. (2016) adopted the service-for-service approach when describing value creation contexts as dependent on service-for-service exchanges, resource integration, and institutions. The service ecosystem's relevance led Vargo and Lusch (2016) to expand the foundational premises of SDL by adding the fifth axiom. They claimed that value creation occurs in a complex context depending on the actors' cooperation and coordination and the effects of institutions and institutional arrangements.

Institutions and institutional arrangements are perhaps the predominantly studied aspect of service ecosystems, with many 2020 publications addressing institutions (see especially Vink et al., 2021). They are norms and regulations that the actors create to facilitate value co-creation in a service ecosystem (Vargo & Lusch, 2014); thus, while institutions are guiding actors toward value co-creation, due to the changes taking place in an ecosystem, they are constantly changing (Akaka & Vargo, 2015) to support all actors in their co-creative roles. The effects of institutions in service ecosystems have been conceptually described by Berthod et al. (2019), who considered power derived from existing institutions a hindrance to the acceptance of new value propositions. Institutionalizing changes from new value propositions is complex and unpredictable (Tuominen et al., 2020). These considerations stress complexity as a key feature of service ecosystems. Complexity results from a service ecosystem's self-adjustment, as it derives from maintaining institutions (Koskela-Huotari et al., 2016; Nenonen et al., 2018). Wieland et al. (2016) confirmed the direct tie between institutions, institutional arrangements, and complexity when combining centricity, service ecosystems' dynamic nature, and value conceptualiations' extension from value-in-use to value-in-context. Recent advancements have deepened the understanding of service ecosystems' complexity (Barile & Saviano, 2018; Gummesson et al., 2018) and how service ecosystems

evolve through institutional work (Nenonen et al., 2018; Sajtos et al., 2018).

Outcomes of service ecosystems

Frow et al. (2015) depicted the shift from service systems to the service ecosystem perspective in terms of value co-creation as an outcome. The authors investigated the dynamic process of value co-creation in service systems as leading to improved conditions for the actors shaping the ecosystem and focused on the ecosystem as the context in which these effects occur. The focus on context was not new in the service ecosystem debate; for Ordanini and Parasuraman (2011), contexts hosting service provision and value co-creation are the service ecosystems themselves, namely, structures, social and economic, whereby actors interact through institutions, technology, and languages. Akaka et al. (2014) proposed that the service ecosystem emerges in a value co-creation context and used symbols to link the new concept to interactions, information, resource integration, and value assessment. Other articles diverged, promoting alternative views of service ecosystem contexts, such as customer ecosystems (Heinonen & Strandvik, 2015), where customers define their own ecosystems' relevant components.

Service ecosystems comprise actors and their relationships, where resource integration occurs due to institutions and institutional arrangements (Ng & Vargo, 2018). Such ecosystems' outcome is value co-creation through service-for-service exchanges. The dynamics and complexity of ecosystem processes lead to the new conceptualization, confirmed by new technologies' crucial role in supporting actors' coordination and cooperation.

Theoretical perspectives on service ecosystems

The analysis identified one dominant perspective in this group, SDL. Vargo and Lusch epitomized SDL's dominance as a perspective in Group 3, framing service ecosystems within SDL as a continuation of the service systems as value constellations conceptualization (Vargo & Lusch, 2014, 2016). Other perspectives in this group, such as transformative service research (TSR) and service innovation, are related to and originate from SDL. Finsterwalder et al. (2017) built on SDL to implement a service ecosystem approach to fill TSR's gaps. Baron et al. (2018) argued that the multilevel approach in service design was a relevant prerequisite to service innovation due to the opportunities provided by the service ecosystem's elements. Vink et al. (2021) framed service design within service ecosystems and SDL.

Helkkula et al. (2018) summarized service innovation's key contributions, presenting four archetypes of service innovation focusing on the value co-created, actors, and their role to depict how service innovation changes service ecosystems. The outcome of service ecosystem innovations was described as a way to generate value for the ecosystem's actors, making the ecosystem sustainable over time (Jonas et al., 2019). In their book chapter, Mele and Russo-Spena (2019) focused on service innovation in service ecosystems as a more suitable frame for capturing the social, cultural, and technological features affecting service innovation outcomes. This chapter exemplifies a shift in service science, especially visible in several chapters in Maglio et al. (2019) edited volume, where service ecosystems also began to pervade service science.

Publications looking forward: bridges towards the future

One article set the stage for further advances in service ecosystem studies: Vargo and Lusch (2017) proposed a research agenda for service scholars and defined service ecosystems as a new unit of analysis in service research. Another observation regarding future development is the ongoing expansion of the service ecosystem concept. Spohrer et al. (2011, 2013, 2017) promoted the concept of *service ecology*. Ng et al. (2019) also declared service ecology the next step, while Simmonds et al. (2018) widened service ecosystems' scope and nature by proposing service ecotones, complex interactional and transitional boundary zones formed by the intersection of relational, technological, and institutional relations that separate functioning and coherent service ecosystems. Essentially, they proposed an ecosystem of service ecosystems.

In such service ecology, service ecotones, or service ecospheres, it is logical to assume that individual service ecosystems are its constituent elements and are involved in extremely complex and intricate exchanges among the ecosystems themselves and their actors. Such service exchanges and resource integration processes are governed by institutions at this supra-level. We have identified at least two publications indicating supra-institutions: Frow et al. (2019) place the micro-, meso-, and macro-levels of service ecosystems within meta-level practices and institutions; Windahl et al. (2020) explained the long-term relevance and consequences of strategic decisions on the meta-level for value-creation system evolution.

More empirical research is expected (Mustak & Plé, 2020); few publications address service ecosystems' practical elements (Lindhult et al., 2018), and less is known about how the continuous service ecosystem rearrangement occurs. Theorizations describe how actors change

their role (Helkkula et al., 2018; Quero & Ventura, 2019); however, how external actors join a service ecosystem, the effects on the relational side, and how value co-creation is affected when new entities join in the short and long term remain unclear. Moreover, certain constituencies, processes, and outputs of service systems in service management have begun to be reframed as service ecosystems, such as service recovery (Arsenovic et al., 2019) and service design (Vink et al., 2021); hence, there is potential for further reframing, for example, of service delivery and service quality vis-à-vis value-in-use.

DISCUSSION AND IMPLICATIONS

The purpose of this article is to systematise the extant research into service (eco) systems and indicate potential future research by tracing the evolution of service systems to service ecosystems. Based on the findings, Table 3 shows conclusions, systematizes future research directions, and proposes potential research questions that could direct relevant research. We then discuss service (eco) system literature evolution by portraying aspects that appear across groups. Finally, we offer glimpses of five intriguing notions of service (eco) systems with the potential to stimulate new research directions: service ecospheres, service ecosystem simplicity, failures of service ecosystems, paradox in service ecosystems, and panarchy and service ecosystems.

Our analysis focused on the evolution of service systems to service ecosystems by identifying the main topics, perspectives, and bridges. To trace the evolution, we identified common denominators that appeared *across groups*. Specifically, we traced the evolution and how the bridges occurred by rendering conceptual movements of three overall aspects of service systems: service systems' constituencies, inherent processes present in service systems, and service system outcomes (Figure 1). We found that the research focus and locus shifted; while Group 1 is primarily interested in marketing management and service firms where service systems are closely related and often essentially equal to service delivery systems or service firms overall, Groups 2 and 3 gradually redefined service systems and, eventually, service ecosystems as more dynamic systems consisting of many actors involved in relationships and creating value for each other. According to this latter conceptualisation, service firms can be considered actors that interact with other actors, which are also service systems, in complex networks and ecosystems based on service exchanges and mutual value (co-)creation.

The notion of the evolution of service systems to service ecosystems is strengthened by other aspects of service systems that appear across groups. The origins of some aspects of service systems are observed in the preceding group(s). For example, complexity was one of the main topics in Group 2. However, service management studies have already described service systems as difficult to manage; managers must strive to make the firm capable of providing services, and workers must be aware of the entire service system (Chase, 1978). Olaisen and Revang (1991) explicitly proposed complexity, as service systems should embed all features necessary to support both service operations and delivery. Moreover, issues of complexity can be acknowledged in Group 3 (Wieland et al., 2016), and complexity will likely be crucial in upcoming conceptualizations of service ecospheres and service ecology.

Another aspect appearing across the groups is the flexibility of service ecosystems, observed in Group 3, as an aspect that enables service ecosystems' longevity and viability. However, Shostack (1987) emphasised changes as an inherent trait of service systems in service management, together with the need to adapt a service system's structure to changes in the business environment. Similarly, service science noted change as a way to perform adjustments to address the evolutionary nature of service systems, in line with the conceptualisation of complex adaptive systems (Maglio et al., 2009). We also noted how certain constituencies, processes, outcomes, and other concepts have shifted along the evolution. Service innovation and customer experience appeared in all three groups. Moreover, some authors invoked the need to understand servitisation from the service ecosystem perspective (Kohtamäki et al., 2019), while others reframed service recovery (Arsenovic et al., 2019) and service design (Vink et al., 2021) from the service ecosystem perspective. In this context, we highlighted how publications in Group 1 emphasized efficiency, leading to the conclusion that a single optimal profitable combination of service system constituencies (Gil Saura et al., 2005) should exist but that this combination must be constantly adapted (Katzan, 2009). Conversely, Group 2's discourse clarified that constituencies' modularity leads to value creation (Bask et al., 2011), while research in Group 3 suggested that this combination and recombination of constituencies is inherent and emergent (Vargo et al., 2015) and that the outcomes of these processes are never fully controllable or predictable (Vink et al., 2021). Consequently, we expect more similar reframing in the future.

Beyond the confinements of existing service system discourses

In an attempt to propel the research in more stimulating directions, we extrapolated five notions which the extant literature only initiated or to which it did not dedicate suitable attention.

TABLE 3 Conclusions, future research directions, and proposed research questions

Group	*Research implications*	*Proposed research directions*	*Proposed research questions*
Service systems in service management Interlinked constituencies such as customers, employees, resources, and technology, designed in an infrastructure that delivers service of superior quality	The interplay among constituencies and the introduction of new technologies (e.g., IoT) update several existing research themes, leading to, for example, the role of employees in such service systems, service encounters and customers' participation, and new ways to customise offerings	Exploration of technology-enhanced service management in the light of the existing updated themes, such as the role of employees in such systems, service encounters, design of such systems, and service customisation	How is employees' role modified in IoT-enhanced service systems? How is 'the moment of truth' during service encounters modified in such service systems? How are such service systems designed? How do technology-mediated interactions in service management systems affect service customisation, service provision, and service quality?
Service systems as value constellations Complex combinations of actors, resources, knowledge, value propositions, and technologies configure service systems and their processes aimed at collaborative value creation	The variety of constituencies led to complexity and required adaptability/flexibility to run successful processes connecting value propositions, technologies, and people	Service systems' adaptability and flexibility Service systems' change processes and dynamics The role of technology vis-à-vis human agency in smart service systems and human-centred service systems	
Service ecosystems Actor-to-actor structures continuously shaped by institutions creating value and well-being through service exchange, in processes that are dynamically changing in line with context	The coordination and cooperation of actors is brought to another level by technology. The adaptation to new technologies is both an innate feature of a service ecosystem and an application of the concept of institutions. Innovation is meant as crucial in furthering service ecosystem viability	The changing role of actors in service ecosystems Technology as a resource in service ecosystems	How do service ecosystems react when new actors join the ecosystem and disturb its equilibrium? How are resource integration and institutions as inherent service ecosystem processes catalysed due to technology? What role does (service) innovation play in this catalysis? How does this reflect on value creation as service ecosystem output?

One such notion is related to the publications that began to bridge service ecosystems and the next step in conceptual development. These publications anticipate the development of service ecology (Ng et al., 2019; Spohrer et al., 2017) and service ecotones as ecosystems of service ecosystems (Simmonds et al., 2018). We expect that future service ecology, service ecotone, and *service ecosphere* (the sums of service ecosystems within a given area) research will propagate. This research, similar to research in previous groups, will likely attempt to provide more insight into ecosphere constituencies, processes, and outcomes. Issues of complexity are highly relevant in the exploration of service ecospheres and service ecology and their constituencies, processes, and outcomes, and some publications have addressed the supra-level of institutions and institutional arrangements (Frow et al., 2019; Windahl et al., 2020).

Another intriguing possibility for scholarly exploration is simplicity as an antipode to complexity. Service system studies have borrowed conceptualizations and tools related to complexity from systems theory (Barile & Polese, 2010). Consequently, this theory could enrich the discussion on service ecosystems by lending the concepts of simplicity and system simplification (Kopetz, 2019). The level of complexity in current service ecosystems is rising, not least due to technology (Barile et al., 2020), with the effect of such increased complexity of service ecosystems being perceived as 'simple'. On the other hand, some systems researchers warned that systems' increasing complexity may lead to their deterioration and that they should consequently be decomplexified and exchanged for other, loosely coupled structures (Ing, 2013). Moreover, adopting the ecosystem simplicity concept from biology may enrich extant research, for example, methodologically. Studying service ecosystems has been deemed challenging regarding capturing all of its complexities (Baron et al., 2018; Brodie & Gustafsson, 2016; Vargo & Lusch, 2017), particularly when the analysis level is raised to a service system or a service ecosystem (Barile et al., 2016). One inspiration from biology is to focus on isolated ecosystems, such as islands, which have proven useful for studying and drawing conclusions about mainland ecosystems (González-Castro & Nogales, 2014).

Another neglected notion in service ecosystem research considers why they (might) fail. As our analysis shows, most research is currently preoccupied with developing concepts, theories, and frameworks (Mustak & Plé, 2020), most focused on constructive service ecosystem mechanisms. However, behaviour within ecosystems can be limited by so-called constraints, that is, structures and mechanisms that can modify and, in many cases, terminate ecosystems (Etxeberria & Moreno, 2001; Pattee, 1972). According to these authors, such constraints do not emerge freely within existing ecosystems but are instead inherited. In translating this reasoning to service ecosystems, constraints might exist affecting constituencies, hindering processes, or preventing ecosystems from realising their outcomes, while the institutions and institutional arrangements shaping service ecosystems may not necessarily emerge but, rather, be fully or partially inherited from the previous renditions of service ecosystems. Thus, the service ecosystem failure notion offers interesting research possibilities regarding service ecosystems' emergence as a trait.

We outlined value creation as service ecosystems' outcome. However, research focused on value destruction and value no-creation began to appear more recently, not necessarily directly linked to service ecosystems (Makkonen & Olkkonen, 2017; Sthapit & Björk, 2020). Presuming that these three outcomes of the so-called interactive value formation (IVF) frequently occur simultaneously within a service ecosystem, tensions between various actors, their service exchanges, and resource integration processes likely arise, leading to tensions between institutions and institutional arrangements shaping the service ecosystem. To understand this paradox as 'contradictory yet interrelated opposites that exist simultaneously and persist over time' (Cunha & Putnam, 2019, p. 95), paradox theory (Smith & Lewis, 2011) may prove useful. Applying the latter authors' dynamic equilibrium paradox model to service ecosystems regarding the three IVF outcomes may lead to new and interesting insights for both fields.

Finally, research merging conceptualizations of service ecosystems and natural ecosystems is appearing (Löbler, 2017; Matthies et al., 2016; Shirahada & Fisk, 2013). This research adapts and propagates the concept of socio-ecological systems existing in other fields of science; hence, infusing insights from those fields in service ecosystem research might prove relevant. We suggest the infusion of the concept of panarchy, which may help explain service ecosystem complexity, flexibility, and transformation. Panarchy suggests that complex systems are structured discontinuously, that they undergo cycles of destruction and renewal, and that cross-scale linkages are critical to system function (Garmestani et al., 2020). When ecosystems face important shocks, adaptive mechanisms and properties within the ecosystem lead it into a new reorganization phase, which produces another exploitation phase (Boyer, 2020).

Limitations

Our literature review disregarded publications explicitly positioned in service operations management, service system optimization, and other related fields within the broader service management domain. One conclusion from this observation is that research of traditional service systems in service management has likely moved to more specialized fields. The inclusion of publications from these fields would likely have generated different results and presented an alternative view of service systems research. To address this limitation, we recommend performing similar literature reviews focusing on service systems in service operations management and service systems optimisation to offer alternative views that complement our research. As a next step, a meta-review presenting a more complete overview of the service systems field might provide insight into the broader field and generate additional integration in this highly exciting branch of service management.

To conclude, we offer a research recommendation that considers performing literature reviews. In this review, we applied four guidelines from Light and Pillemer's

(1984) seminal methodological work on systematic literature reviews. While widely used in medicine (Lau et al., 1997) and quantitative literature reviews (Hox et al., 2017), their recommendations are rarely applied in management studies. Thus, our adaptation of their guidelines to our qualitative literature review introduces Light and Pillemer (1984) to management studies with the potential for a further and broader application of their recommendation-derived methods.

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