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Service Oikos as a complex self-perpetuating system: A bibliometric study of service ecosystems

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MANUSCRIPT DETAILS: Service Oikos as a complex self-perpetuating system: A bibliometric study of service ecosystems

: This study aims to address the following research questions: (1) What are the theoretical frameworks and areas of study that influence the development of service ecosystems? and (2) To what extent does a service ecosystem align with the theoretical concepts presented in other research contexts within the study areas, thereby transforming the fundamental structure of the core concept?conducted a bibliometric systematic literature review, analyzing 280 papers from a sample of 52 journals listed in the Association of Business Schools. The review covered the period between 2004 and 2022, and we utilized co-citation analysis, multi-dimensional scaling analysis, and hierarchical cluster analysis on a total of 2,614 citations.study employs co-citation analysis to identify the conceptual structure of the service ecosystem based on highly cited papers. Additionally, we utilize multidimensional scaling (MDS) to uncover key approaches driving service ecosystem research. Through hierarchical cluster analysis (HCA) and network analysis, we examine the research scope and its development, emphasizing theory-driven approaches. By combining quantitative and qualitative analysis, we explore the interrelationships between scope, domain, and evolution. This comprehensive analysis allows us to delve deeply into the study of service ecosystems. To broaden the research scope, we propose a conceptual framework for comparing the main components of a service ecosystem. The current paper clarifies the service ecosystem's intellectual structure, including service performance, humanistic approach, sustainable innovations, and service reflexivity and reformation, and proposes a prospective research framework for specialists and researchers by introducing a metaverse service ecosystem._RESEARCH_LIMITATIONS/IMPLICATIONS_(LIMIT_100_WORDS) :No data available._PRACTICAL_IMPLICATIONS_(LIMIT_100_WORDS) :No data available.the first time, the findings of this study shed light on processes that facilitate the flow of technologies, business models, and markets through social structures, ultimately contributing to social changes. In service-based systems, the development and application of a more humanistic approach within and surrounding social service ecosystems is crucial as they evolve. Therefore, adopting a dynamic and multifaceted approach offers valuable insights into the drivers of value creation.

Service Oikos as a complex self-perpetuating system: A bibliometric study of service ecosystems

Abstract

Purpose

This study aims to address the following research questions: (1) What are the theoretical frameworks and areas of study that influence the development of service ecosystems? and (2) To what extent does a service ecosystem align with the theoretical concepts presented in other research contexts within the study areas, thereby transforming the fundamental structure of the core concept?

Design/methodology/approach

We conducted a bibliometric systematic literature review, analyzing 280 papers from a sample of 52 journals listed in the Association of Business Schools. The review covered the period between 2004 and 2022, and we utilized co-citation analysis, multi-dimensional scaling analysis, and hierarchical cluster analysis on a total of 2,614 citations.

Findings

This study employs co-citation analysis to identify the conceptual structure of the service ecosystem based on highly cited papers. Additionally, we utilize multidimensional scaling (MDS) to uncover key approaches driving service ecosystem research. Through hierarchical cluster analysis (HCA) and network analysis, we examine the research scope and its development, emphasizing theory-driven approaches. By combining quantitative and qualitative analysis, we explore the interrelationships between scope, domain, and evolution. This comprehensive analysis allows us to delve deeply into the study of service ecosystems. To broaden the research scope, we propose a conceptual framework for comparing the main components of a service ecosystem. The current paper clarifies the service ecosystem's intellectual structure, including service performance, humanistic approach, sustainable innovations, and service reflexivity and reformation, and proposes a prospective research framework for specialists and researchers by introducing a metaverse service ecosystem.

Originality

For the first time, the findings of this study shed light on processes that facilitate the flow of technologies, business models, and markets through social structures, ultimately contributing to social changes. In service-based systems, the development and application of a more humanistic approach within and surrounding social service ecosystems is crucial as they evolve. Therefore, adopting a dynamic and multifaceted approach offers valuable insights into the drivers of value creation.

Keywords: Service ecosystem; intellectual structure; service performance; bibliometrics; Bibexcel

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1. Introduction

The term service ecosystem is rooted in that of a business ecosystem, which found its origins in the idea of value networks. This concept has led to service design developments to improve the appreciation of customers' value (Clarysse et al., 2014; Sudbury-Riley et al., 2020). Service ecosystems are considered as a fundamental concept of service-dominant logic (S-D logic)(Vargo et al., 2023) and are also the primary analysis for the theoretical explanations (Vargo and Lusch, 2017). The idea of S-D logic value co-creation originates from the service exchange concept, which has received significant attention in the business and marketing literature (Alexander et al., 2018; Klafke et al., 2023; Vargo and Lusch, 2019; Vink et al., 2020; Zaborek and Mazur, 2019). Subjects discussed in service ecosystems convey the necessity of understanding value co-creation (Frow et al., 2016; Polese et al., 2021), which leads to social well-being (Vargo et al., 2008). Since the service ecosystem consists of numerous interrelated players who cooperate explicitly or implicitly (Hlee and Lee, 2023; Mustak and Plé, 2020), in business, management, and marketing, there are different reasons for the growing interest in the service ecosystem (Cunha et al., 2020; Sklyar et al., 2019; Wirtz et al., 2023).

One of the critical reasons for this increased attention is the growing dissatisfaction of organizations, employees, and customers with service processes. As a result, organizations are eager to take the initiative by offering more innovative processes to provide services and improve their performance (Baron et al., 2014; Payne et al., 2021; Swanson, 2007) in order to prepare for the global marketplace (Tiki and Little, 2022; Woods and Lewis, 2021). Hence, shifting from single service systems to service ecosystems has become the focus of scholarly attention (Danatzis et al., 2022; Lusch and Spohrer, 2012; Maglio and Spohrer, 2013) as service ecosystems have been enabling this advancement, then service providers progressively trust ecosystems owing to the growing complication of current service delivery, and scientists connectedly distinguish the systemic essence of value creation (Mody, 2023; Sehn et al., 2023).

Many studies have been done in this field. For example, West (2017) discussed a more profound and systemic view of service ecosystems in developing social systems. This view provides deep insights into value co-creation through the interaction and exchange of knowledge among actors (Weretecki et al., 2020). Also, Sawyer (2005), Geels (2004), and Taillard et al. (2016) discussed individual actions, interactions with the broader service ecosystem, social emergence, and institutional change. As Akaka et al. (2013) commented, such a multilevel and cross-institutional method toward value co-creation is essential in service ecosystems. Furthermore, prior research has demonstrated that a service ecosystem perspective could assist researchers in comprehending international markets more fully (Kaartemo et al., 2017). Notably, the service ecosystem viewpoint explains some processes that attract attention to the role of social structures in providing the circulation of technologies, business models, and markets while shedding light on the enhancement of social changes (Vargo, 2020).

Many advances in service ecosystems provide opportunities for further studies on their role in creating and evaluating the outcomes of co-creation processes (Cassia et al., 2020). Developing and applying a more humanistic approach in and around the social service ecosystem (Baker et al., 2020) is crucial in service-based systems. Indeed, a dynamic and multifaceted approach offers significant insights into the factors that drive value creation (Akaka et al., 2013). Nevertheless, despite progress in the literature, investigations into the service ecosystem remain in their nascent stages. The findings of prior studies on service ecosystems appear fragmented and dispersed (Gölgeci et al., 2022; Philips et al., 2023). As a result, there is a gap in achieving a comprehensive understanding of the construction of this research domain (Thompson-Whiteside et al., 2023; Vargo et al., 2023; Vrontis and Christofi, 2021). For instance, while numerous studies have delved into the dimension of technology and its intrinsic connection with the service ecosystem (Herterich et al., 2023; Papanikolaou et al., 2023; Wirtz et al., 2023), the evolution of technology and the emergence of smart service ecosystems, especially the role of the metaverse, remain ambiguous in this field. This ambiguity persists despite the rise of groundbreaking digital technologies, such as artificial intelligence, blockchain, cloud computing, big data, edge computing, 5G/6G, VR/AR/MR, and the Internet of Things. These innovations herald an exciting era of the metaverse, which will profoundly influence the domain of services (Kozinets, 2022). Such challenges contribute to knowledge fragmentation and underscore the need for greater collaboration (Sklyar et al., 2019) in systematic reviews.

In response to the considerations mentioned above, this research aims to contribute to the field of service ecosystems by using bibliometrics and combining qualitative and quantitative analyses (Chabowski et al., 2013; 2015; 2018; Wilden et al., 2017). It also aims to visualize the scientific map of service ecosystems by providing the intellectual structure, which can benefit managers, policymakers, and scholars. Because of the non-biased nature of bibliometrics (Akbari et al., 2022a; Akbari et al., 2022b, Foroudi et al., 2021), the current research will contribute to this area without bias and will improve future research rigor by using bibliometric analysis. A conceptual framework is proposed based on the study of groups and clusters using multi-dimensional scaling (MDS) and hierarchical cluster analysis (HCA) analysis and recent papers to present the impacts of the metaverse on this field and the future of the service ecosystem. Our framework represents the conceptual development of the subjects in service ecosystems over time. The core processes of service ecosystems represented in our framework include providing a new service design based on promising reformation, reflexivity, and a humanistic approach in various contexts (Vink et al., 2020) coupled with representing the effects of new technologies, especially the metaverse, on the service ecosystem domain.

To address the aim of this study, two research questions have been proposed: (1) What are the theoretical frameworks and study areas influencing service ecosystem development? and (2) To what extent does a service ecosystem converge with the theoretical concepts presented in other research contexts within the study areas that convert the basic structure of the core concept? This study improves the literature in two ways: first, by offering a quantitative approach to the conceptual structure of the service ecosystem over co-citation analysis, we

highlighted the relationships between most highly cited papers and identified knowledge foundations of service ecosystem scope. Also, by applying MDS and HCA, we identified intellectual structure of this research area, as well as some pioneer approaches in service ecosystem domain.

Also, we identified the research scope and development based on a theoretical approach using HCA and network analysis; we identified the interrelationships of the scope of this study knowledge, domain, and evolution from a theory-driven viewpoint and introduce to answer to the research question (1). The simultaneous application of qualitative and quantitative analysis, disclosing the relationship between papers, and gathering theoretical perspectives enabled us to investigate the service ecosystem basis thoroughly. Thus, we offer a conceptual framework to expand the research scope by comparing the main components of a service ecosystem to answer research question (2).

In the following sections, we offer a detailed overview of the service ecosystem by proffering relevant theoretical perspectives and conceptual basics of the service ecosystem. Then, based on our methodology, we use bibliometric analyses. Finally, a conceptual framework is offered for future studies.

2. Overview of a service ecosystem

There is a paradigm shift in considering services as intangible outputs that unravel how service design evolves. This leads to a deeper understanding of four conceptual structures of service design: actors (who), processes (how), materials (what), and purpose (why) (Vink et al., 2020). According to S-D logic, service exchange does not happen simply by linking service providers and consumers. Instead, it is defined by dynamic interactions between those who benefit from the service ecosystem (Vargo et al., 2015; Vargo and Lusch, 2016; 2017; 2019). Service ecosystems are viewed as complex phenomena generated by both international and domestic structures (Kaartemo et al., 2017). Additionally, ecosystem actors are defined by resource integration, and the network's objectives include collective well-being and individual identity (Vargo and Lusch, 2016; 2017). In international and domestic markets, more research is needed on the service ecosystem in social and cultural fields (Kaartemo et al., 2017).

Along with system theory, service ecosystems deliver a perspective for identifying the interactions between organizations, actors, and technology to create service value co-creation (Vargo and Akaka, 2012). There has been research into differences between broad national systems (macro-level), such as institutional development, and specific components of national systems, such as consumer behavior (micro-level). Macro-level studies have tended to focus more on international issues. By using standard strategies, marketing managers can minimize costs and efforts by observing similarities in customer behavior (Javalgi and Martin, 2007). A service ecosystem comprises the continuous interaction of actors, such as institutions or individuals, leading to value co-creation at the micro-level (Perks et al., 2012). As an example, shifting stakeholder co-creation focus from macro- to micro-levels (Storbacka et al., 2016) illustrates the antecedent role of stakeholder engagement in

innovation management (Leonidou et al., 2020) Concerning different levels, changing procedures at one level affects procedures at another level. For instance, macro-level alterations affect components of another level, and micro-level changes can affect components of upper levels (Frow et al., 2016). The main goals of research conducted at different levels are to understand how individual-level variables affect businesses and how interactions between people and resources lead to performance and results at the organizational and international levels (Christofi et al., 2021).

Despite the emphasis on firm-level resources, management, and firm characteristics in the literature (Javalgi and Martin, 2007), the social and cultural context remains unaddressed. Regarding the expansion of the topic, a wide-ranging systematic assessment of service ecosystem areas is required. Vargo and Lusch (2017) suggested that by comprehensively addressing the service ecosystem in the service-based organizations context, such a concept can deliver valuable insights for managers, marketers, and policymakers. Similarly, in an academic setting, this concept can deliver wide-ranging conceptual frameworks. The main elements of the frameworks include service ecosystem actors, resources, institutions, and technologies that fit well in future service ecosystem developments (Vargo and Lusch, 2016).

The conceptual foundations of the service ecosystem

Although there is a focus on various service offerings, some researchers have reported increasing service contributions in the service design processes (Patrício et al., 2018). The current research helps researchers to design services based on an understanding of service systems and to renovate them to provide value co-creation in a particular position (Windahl and Wetter-Edman, 2018; Wetter-Edman et al., 2014). Kimbell (2011, p. 48) suggested that "far from being intangible, a service can be thought of as both social and material." Furthermore, taking an anthropological viewpoint, Blomberg and Darrah (2015, p. 127) proposed that service is "assembled from fragments of practices, institutions, lifestyles, technologies, and networks."

In the context of service ecosystems, relationships in a complex market are dependent, consistent, and systemic. According to S-D logic, as the core concept of a service ecosystem: (1) service ecosystem actors are involved in service interchange; (2) numerous actors, consisting of service beneficiaries or recipients, deliver value co-creation; (3) actors have access to resources; (4) value co-creation is proposed by actor-generated organizations; and (5) the value obtained from the interchange between the actors is determined by the beneficiary (Vargo and Lusch, 2016; 2017; 2019).

Notably, service ecosystems are intrinsically non-static. The "evolution toward at least some stability is part of an institutionalization process in which rules are developed and shared and become a vital coordination mechanism" (Lusch et al., 2016, p. 2960). Hence, a service ecosystem is flexible, and the actors should be conscious of any disorder to see all changes (Adner, 2012). Service ecosystem perspectives are conceptualized in terms of social norms and meanings that support actions (Scott, 2013; Vargo and Lusch, 2016; 2017). Despite several frameworks related to service ecosystems, the topic formulated decades ago lacks a

fundamental theoretical viewpoint. The following part and Table 1 draw readers' attention to the service ecosystem viewpoint, discipline, concept, definition, dimensions, and contexts concerning service ecosystem topics.

Discipline	Concept	Definition	Dimensionality	Context	References
Business research	Ecosystem	An ecosystem is defined as "a system of organisms occupying a habitat, together with those aspects of the physical environment with which they interact " p. 2.	biological ecosystem, industrial ecosystem, the economy as an ecosystem, business ecosystems	business environments	Peltoniemi and Vuori (2004)
Service requirements engineering	Digital service ecosystem	The digital services ecosystem is a new type of self-ordered setting that deals with directness and dynamism, supporting collaborative innovation and co-creation between ecosystem actors. It should be provided digitally, is fully automated, which customer service controls.	ecosystem members, ecosystem capabilities, ecosystem infrastructure, digital services	value network	Chang and West (2006); Palmié et al. (2022)
Business research	Multi-actor service ecosystem	Through the multi-actor service ecosystem, the reliability of other customers reinforces the optimistic impact of their citizenship behavior on key customers' citizenship behavior. The more significant the understanding of other customers' reliability, the more compelling and impactful the perceived source.	focal customers, other customers, service providers, bystanders	service failure and complaint behavior	Yi et al. (2013); Chen et al. (2020)
Business services	Product-service innovation	Product-service innovation improves innovation consequences through knowledge sharing and enlightening the customer needs.	base services, intermediate services, advanced services	servitization-performance relationship	Bustinza et al. (2017); Bustinza et al. (2019); Vendrell-Herrero et al. (2017); Dalenogare et al. (2022)
Business services	Internal service	The internal service ecosystem is how front/back-office abilities are improved, and the interdependencies are necessary for business	front-office service capabilities, back-office service	servitization	Baik et al. (2019); Hullova et al. (2019); Jovanovic et al. (2019);

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	ecosystem	service.	capabilities		Skylar et al. (2019)
Marketing	Social service ecosystem	A macro-structure shows the interaction among macro, meso (contextual), and micro issues in appreciating and providing value to receivers. A macro-structure identifies the collaboration of macro, meso, and micro-elements in appreciating and providing value to receivers.	design, practices, actors, resources	recipients' daily lives and interactions (meso)	Trischler and Charles (2019)
Production research	Manufacturing service ecosystem	The manufacturing service ecosystem is a non-hierarchical collaboration in which various institutions and individuals work together on new combinations of value-added products and product-related services.	supply-side agent (e.g., producer, provider, seller, etc.), demand-side agent (customer)	manufacturing	Chesbrough (2011); Jian-liang and Yushun (2010)

Within the scope of business research and business services, the concepts of ecosystems and digital service ecosystems were given the utmost importance (Palmié et al., 2022). The term 'ecosystem' includes biological ecosystems and industrial ecosystems, and, indeed, considers the economy as an ecosystem. Furthermore, an ecosystem primarily evaluates business environments (Peltoniemi and Vuori, 2004). The applications of the service ecosystem in business services are extensive and emphasize essential concepts. These applications include a multi-actor service ecosystem, product-service innovation, internal service ecosystem, social service ecosystem, and manufacturing service ecosystem.

The multi-actor service ecosystem's primary focus has been on the credibility of other customers' strengths and on how it can positively affect citizenship behavior. It considers principal customers, new customers, service providers, and intermediaries to find the causes of service failure and complaint behavior contexts in a service ecosystem (Yi et al., 2013; Chen et al., 2020). As the significance of the performance relationship in servitization increases, the concept of product-service innovation improves the innovation consequences through knowledge sharing and customer-needs enhancement (Bustinza et al., 2017, 2019; Dalenogare et al., 2022; Vendrell-Herrero et al., 2017). Another essential concept in servitization is evaluating the internal service ecosystem to improve performance. This concept emphasizes front-office and back-office service abilities, how they have developed, and their interdependencies as essential considerations for firms that offer services (Baik et al., 2019; Hullova et al., 2019). Despite considering the internal environment of a service ecosystem, the concept of a social service ecosystem focuses on its whole structure. A social service ecosystem highlights the interplay between three contextual factors to deliver value to recipients' daily lives and interactions (Trischler and Charles, 2019).

In production research, the manufacturing service ecosystem (MSE) concept is a collaboration where different organizations and personnel provide new value-added combinations. MSE is defined as a composite 'social-cyber-physical' system that can be analyzed through different networks (Chesbrough, 2011; Jian-liang and Yushun, 2010). Lastly, Table 1 above demonstrates central concepts in service ecosystems, their definitions and dimensionality, and the context in which they are primarily used.

The core theoretical foundations of a service ecosystem

Service ecosystem research focuses on several aspects related to servitization, business management, and marketing (Jovanovic et al., 2019; Makkonen et al., 2022; Sklyar et al., 2019; Sörhammar et al., 2021). This research aims to offer seven essential theoretical viewpoints used extensively in the service ecosystem literature. Table 2 demonstrates the range of theories pertinent to service ecosystems. Although the service ecosystem scope can be explored in a multi-dimensional way, in the present study, we have focused on crucial theoretical viewpoints including exchange, growth, structuration, practice, institutional, consumer culture, and public value theories.

Exchange theory – Marketing has shifted from dominant logic to exchanging tangible goods (i.e., manufacturing industry) and more toward exchanging intangibles, specialized skills, knowledge, and processes. We believe that these commodities point marketing towards a wide-ranging dominant logic that merges products and services to offer a more substantial basis for developing marketing thoughts and practices (Shostack, 1977). Moreover, in developed societies, individuals depend on exchanges with others to use related knowledge and expertise. Hence, a service exchange at the micro or macro level in the service ecosystem has affiliated organizations. For instance, businesses like Hilti (fastener solutions) provide services based on comprehensive information exchanges with other businesses or individuals (Greer et al., 2016).

Growth theory – From the Penrosian perspective, the growth theory evolves through multiple phases. The initial phase involves businesses competing to secure resources within the service ecosystem. These businesses then utilize these resources to deliver what are termed as 'service streams,' which are manifested as service outputs (Penrose, 2009; Wirtz et al., 2023). Petrossian's emphasis is on service competition, which is the foundation of business and marketing research. This perspective explains that businesses can effectively control resources and provide service efficiency outputs (Chandler and Vargo, 2011). In the 1940s to 1950s, Penrose proposed business growth theory instead of service theory to have more transparency in the development of businesses.

Structuration theory – This offers a critical understanding of the role that practices play in renovating social structures. The practice approach supports studying value co-creation (Edvardsson et al., 2011) as social systems that are renovated through enacting practices (Whittington, 2010). Social systems, like service systems, are made of systems and structures. Structures concentrate on the dependent state of structures and systems that express how practices drive the proliferation. This perspective contributes to providing a broader viewpoint on service ecosystems, which leads to service science and, in particular, research into value co-creation in service systems. Therefore, structuration theory seeks a deeper appreciation of its application in service sciences and service exchange systems (Giddens, 1984). Likewise, this theory offers a valuable perspective on service ecosystems, directing service science and, in particular, the study of value co-creation within these ecosystems (Simmons and Durkin, 2023). The structuration theory, as a comprehensive social theory, holds the potential to enhance both service sciences and service exchange systems.

Institutional theory – Institutional logic has been identified as the accepted rules that guide actors' behavior at the field level and the associated practices in the organizational context. This theory originates from various theoretical foundations, for instance, sociology, organizational studies, and economics. Primary institutional theories concentrate on many conditions through considering the integration of actors' involvement. In fact, institutions based on primary institutional theories influence service systems and value co-creation created through an actor's involvement (Friedland and Alford, 1991; Jarzabkowski et al., 2009).

The institutional theory highlights the diversity and complexity of organizational arrangements that are simultaneously available to actors. However, when insights from institutional theory are integrated with perspectives on service ecosystems, the institutional arrangements become particularly challenging. Furthermore, several service approaches have been derived from institutional theory (Scott, 2014; Thornton et al., 2012; Vargo et al., 2023).

Practice theory – This is an action regulated by tools, technical knowledge, images, physical space, and an actor performing an action that can be considered an anti-individualist state (Schatzki, 2001). In fact, they include contextual skills that provide exchanges between actors (provider and customer) (Orlikowski, 2007; Reckwitz, 2002; Schatzki, 2006) on the service ecosystem. They are a combination of mental settings, artifacts, technology, discourse, values, and symbols (Bourdieu, 1977; Duguid, 2005).

Public value theory – This is about human activity that is often about action in all areas of systematical contexts, such as institutional and organizational. This theory is a "contested democratic practice" (Benington, 2015:29). Studies use the concept of public value to survey whether and how different factors and groups can construct public value. They also focus on the contexts, the basis, and the objectives of managerial reasoning, consider which individuals or groups should be included or excluded in the service ecosystem regarding society's public value, and finally, predict what the consequences of such cases would be (Hartley et al., 2017).

Consumer culture theory – Consumer culture theory (CCT) research offers a marketing viewpoint highlighting the cultural fullness of the context that frames experience. This theory focuses on the affective textual and symbolic parts of consumption. Customers can also be considered feelers, doers, and thinkers. Here, such manners may not be goal oriented. In this theory, the value is in the experience of consumption, not in the object (Arnould and Thompson, 2005). For example, when actors exchange services for services, they co-create value in the service ecosystem through resource integration. This process is enabled and bounded by consumer culture theory (Carrillo et al., 2019).

The service ecosystem concepts, theories, applications, and fundamentals have recently received more attention regarding these considerations. This study aims to deliver a new bibliographic study of the service ecosystem in management and marketing. To this end, this research seeks to consider a robust conceptual structure of the service ecosystem through influential authors, papers, and journals. It also contributes to clarifying the reasons behind the studies conducted in this field and identifies the fundamental knowledge structure that can be considered in future studies. Below is a summary of theories, definitions, scopes, and limitations.

Table 2: Summary of Focal Theoretical Viewpoints in the Service Ecosystem

Theory	Definition	Scope	Limitations	References
Exchange theory	Exchange of tangible goods and exchange intangibles, specific skills, knowledge, and processes.	The primary marketing glossary results from the perspective of good-based and product exchange.	A suitable exchange unit is no longer a tangible and static commodity.	Shostack (1977)
Theory of growth	The theory of growth leads resources and services together in one field. It describes how resources yield services.	Growth theory arises in several stages, the first being by companies challenging for resources. This process lasts while resources are used to provide "service streams" that eventually fill the field with service outputs.	The resources are limited, and the capability to possess and control them is considered the main driver of its services and performance.	Chandler and Vargo (2011), Penrose (1959)
Structuration theory	The theory can explain how social conduct rules influence individuals' activities and reproduce them by acting.	In structuration theory, three scopes in a social system were identified by Giddens (1984): (1) signification/meaning; (2) domination/control; and (3) legitimation/morality.	Structuration theory lacks consideration of the dynamics of institutions that are desired to comprehend organized change.	Giddens (1984)
Institutional theory	It is defined as a set of material practices and symbolic constructions which constitutes its organizing principles and which is available to organizations and individuals to elaborate.	Institutions have a significant role in determining the way an actor behaves when handling the resource integration and value co-creation of service systems.	Institutional logics allows for value co-creation and the integration of resources but may create barriers. Therefore, it should be seen as an essential factor of the service ecosystem that surrounds any value co-creation.	Friedland and Alford (1991), Scott (2013)

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Practice theory	Practice theories consider organizations as common ways actors form to act and understand other actors' activities.	Practice theory believes that achievement is promising and comprehensible only in typical and shared practices and forms social direction.	A practice is determined neither by the actor nor by context alone but more explicitly integrates resource elements.	Bourdieu (1977), Duguid (2005), Foucault (1977), Giddens (1984), Orlikowski (2007), Reckwitz (2002), Schatzki (2006)
Public value theory	Value theory is used to research the static structure and dynamic changes of ecosystems.	Two sides of value co-creation are valued, that is, for the customer and for economic value, focusing specifically on value creation.	Unlike customer value, public value has different dimensions that cannot be calculated.	Arrow (2003), Basole and Rouse (2008), Gordon (1964)
Consumer culture theory (CCT)	Consumer culture theory (CCT) research offers a viewpoint of markets that highlights the cultural fullness of the context in which experience is placed.	By expanding the temporal and social range of the experience and placing it in a cultural context, the CCT area considers the studies made on market-oriented experiences outside particular company-customer interactions.	Through CCT study, cultures do not already exist or are static. Instead, inside CCT, cultures are made up of heterogeneous implications and several perspectives that overlap and are constantly evolving.	Arnould and Thompson (2005)

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Methodology

We used the bibliometric systematic literature review to find evidence of the service ecosystem topic and the related literature (Philips et al., 2015; Christofi et al., 2017). Bibliometric analysis helps researchers to realize the boundaries of the area they study, pursue relevant papers and identify the prevalent contributions made in relevant fields, and guide future studies (Chabowski et al., 2018; Ferreria, 2018). Bibliometric analysis has the benefit of delivering a balanced approach to examining the scope of the service ecosystem literature, such as influential research, authors, papers, and other research foundations (Danatzis et al., 2022; Nerur et al., 2008; Kumar, 2019); it also helps researchers to recognize scholarly communities through graphic demonstration of the literature review.

Study strategy

The bibliometric assessment began by using the single keyword 'service ecosystem' to identify papers in the field from 2004 to 2022. This timeframe was selected based on the introduction of articles in the field of service ecosystems, grounded in the theory of service-dominant logic (SDL). SDL was proposed by Vargo and Lusch in 2004, and the field has been examined continuously up to the present. The data were gathered from Scopus, one of the most inclusive databases for scientometric publications (Mongeon and Paul-Hus, 2016). After choosing the database, we tracked the recommended: "bibliographic research" (Chabowski et al., 2018). Also, we searched the selected keywords from the title, keywords, and abstracts across all business and management literature from a sample of 52 journals in the Association of Business Schools (ABS) list with 2,614 citations. After selecting the search filters, we determined the scope of the study, which plays an essential part in maintaining the service ecosystem and its intellectual structure (Zupic and Carter, 2015) (Figure 1). Thus, papers with an auxiliary focus on service ecosystems were excluded and, as a result, 280 documents remained.
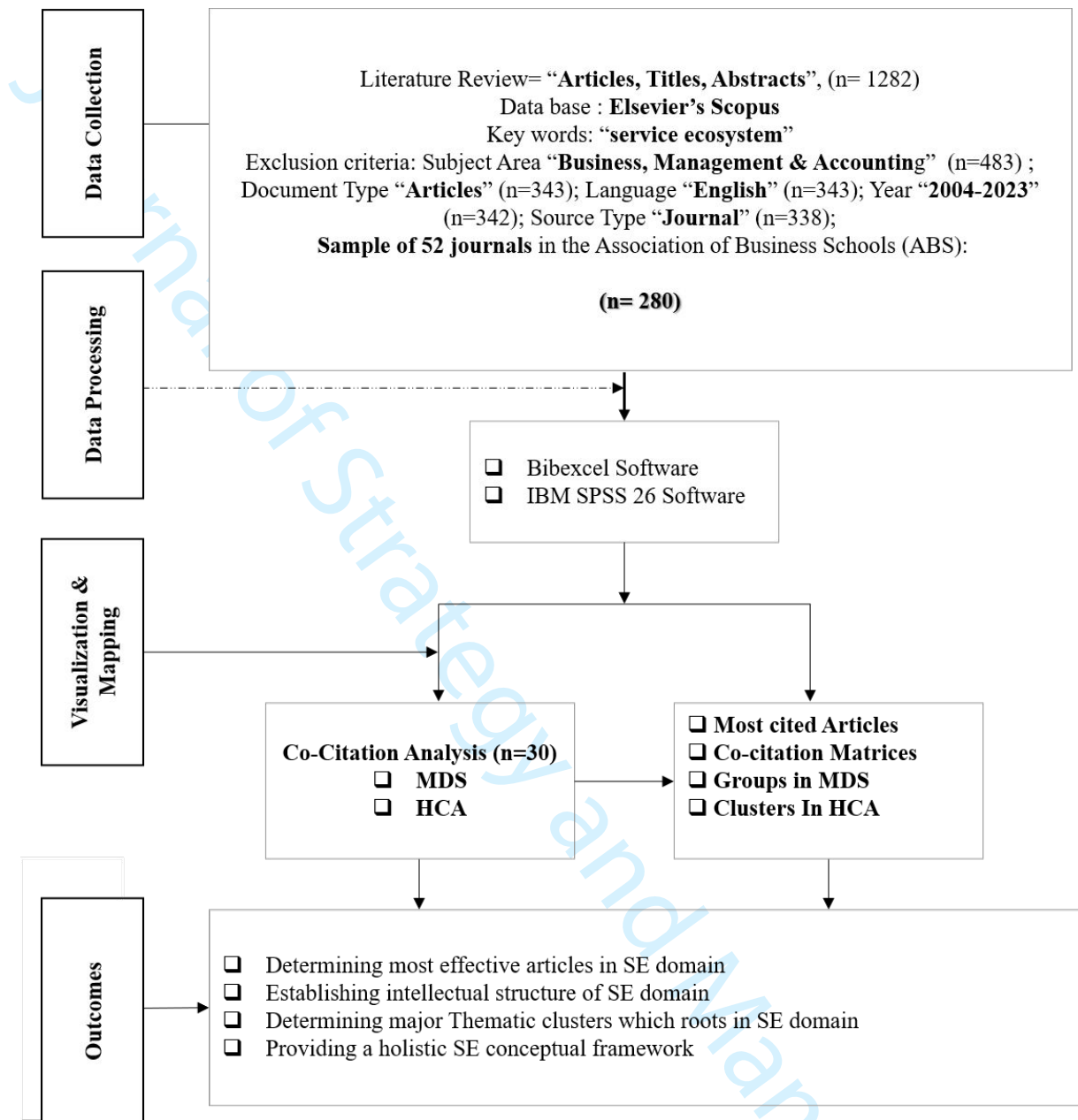
Figure 1: Research design (authors' representation).

Multi-dimensional scaling

Collecting papers from the Scopus database, we began coding the extracted data so that they are registered by being transferred to Bibexcel. We also implemented a co-citation analysis to specify the most cited papers and identify the interrelationships within the service ecosystem (Chabowski et al., 2013) which helped us expand a co-citation matrix for future studies. MDS analysis is applied to recognize the knowledge domain based on the interrelationships between papers and to check the robustness of the interactive data by investigating the potential predictability of the model (Chabowski et al., 2013; Meulman, 1992). MDS analysis offers scholars the chance to organize rigorously the conceptual structure of the research

domain (Chabowski and Mena, 2017; Hair et al., 2014). In this study, we applied MDS to provide maps of objects representing resemblances, closeness, and relations in a multi-dimensional area (Cox and Cox, 2008; Zupic and Carter, 2015). We also visualized published papers' networks by considering the similarities, divergences, and intervals among the scholars who had published on the particular issue by detecting the critical aspects of the service ecosystem domain (see Danatzis et al., 2022; Nerur et al., 2008; Yang et al., 2014).

Hierarchal Cluster Analysis

HCA is used to increase the rigor and robustness of research (Speldekamp, 2020). This analysis determines subcategories and the current intellectual process of the research area through object similarities. HCA also extracts a dendrogram to visualize the cut-off' procedure (Janssens, 2007), thus helping the researcher choose issues separated into distinct clusters. By way of the most typical protocols applied for determining clusters, the connection-based clustering method, identified as Ward's method, gives scholars the chance to acquire interpretive outcomes (Muthahharah and Juhari, 2021; Ogasawara and Kon, 2021; Yari et al., 2021). Although MDS analysis presents in-depth outcomes to the research domain's conceptual structure, HCA analysis delivers a compelling perspective on the study area.

Table 3 shows highly cited journals on the service ecosystem domain through citation and co-citation analysis: *Journal of Business Research, Journal of Service Research,* and *Journal of Service Management*. From 2004 to 2022, 27 articles on service ecosystems were available in the *Journal of Business Research*, which is equal to 17.3% of all publications; 22 articles in the *Journal of Service Research* (14.1%); and 21 papers in the *Journal of Service Management* (13.4%). Also, Table 4 demonstrates highly cited papers on service ecosystems besides their co-citation analysis.

Table 3. Highly cited journals in the service ecosystem

1	Journal of Business Research	27	17/3	27	European Management Journal	1	0/6
2	Journal of Service Research	22	14/1	28	Journal of International Marketing	1	0/6
3	Journal of Service Management	21	13/4	29	Journal of Small Business and Enterprise Development	1	0/6
4	Marketing Theory	9	5/7	30	Business Process Management Journal	1	0/6
5	TQM Journal	8	5/1	31	Journal of Financial Services Marketing	1	0/6
6	Service Science	4	2/5	32	International Journal of Contemporary Hospitality Management	1	0/6
7	Service Industries Journal	4	2/5	33	Industrial Management and Data Systems	1	0/6
8	Industrial Marketing Management	4	2/5	34	International Journal of Services Operations and Informatics	1	0/6
9	Public Management Review	3	1/9	35	International Journal of Research in Marketing	1	0/6
10	European Journal of Marketing	3	1/9	36	International Entrepreneurship and Management Journal	1	0/6
11	Journal of Strategic Marketing	3	1/9	37	Information Resources Management Journal	1	0/6
12	Journal of Business and Industrial Marketing	3	1/9	38	International Journal of Production Research	1	0/6
13	Journal of Retailing and Consumer Services	2	1/2	39	International Journal of Construction Management	1	0/6
14	Journal of Information Technology	2	1/2	40	Journal of Information Technology Management	1	0/6
15	Marketing Intelligence and Planning	2	1/2	41	Research Technology Management	1	0/6

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16	Journal of Personal Selling and Sales Management	2	1/2	42	Journal of Business Logistics	1	0/6
17	International Journal of Quality and Service Sciences	2	1/2	43	Journal of Product Innovation Management	1	0/6
18	Journal of Public Policy and Marketing	2	1/2	44	Journal of Marketing Management	1	0/6
19	Tourism Review	1	0/6	45	Journal of Marketing	1	0/6
20	Tourism Analysis	1	0/6	46	Technological Forecasting and Social Change	1	0/6
21	Meditari Accountancy Research	1	0/6	47	Psychology and Marketing	1	0/6
22	Management Research Review	1	0/6	48	Managing Service Quality	1	0/6
23	Journal of Supply Chain Management	1	0/6	49	Journal of the Academy of Marketing Science	1	0/6
24	Tourism Management	1	0/6	50	Journal of Product and Brand Management	1	0/6
25	Total Quality Management and Business Excellence	1	0/6	51	Services Marketing Quarterly	1	0/6

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Table 4. The most cited publications on the service ecosystem

Rank	Publication	Source	Citation frequency
1	*Journal of Marketing*	Vargo, S.L., Lusch, R.F. (2004)	57
2	*Journal of the Academy of Marketing Science*	Vargo, S.L., Lusch, R.F. (2016)	53
3	*Journal of the Academy of Marketing Science*	Vargo, S.L., Lusch, R.F. (2008)	48
4	*Marketing Theory*	Chandler, J.D., Vargo, S.L. (2011)	43
5	*Journal of the Academy of Marketing Science*	Edvardsson, B., Tronvoll, B., Gruber, T. (2011)	31
6	*International Journal of Research in Marketing*	Vargo, S.L., Lusch, R.F. (2017)	29
7	*European Management Journal*	Vargo, S.L., Maglio, P.P., Akaka, M.A. (2008)	26
8	*Journal of the Academy of Marketing Science*	Grönroos, C., and Voima, P. (2013)	22
9	*Industrial Marketing Management*	Vargo, S.L., Wieland, H., Akaka, M.A. (2015)	21
10	*Journal of Business Research*	Storbacka, K., Brodie, R. J., Böhmann, T., Maglio, P. P., and Nenonen, S. (2016)	20
11	*Marketing Theory*	Edvardsson, B., Kleinaltenkamp, M., Tronvoll, B., Mchugh, P., Windahl, C. (2014)	19
12	*Journal of International Marketing*	Akaka, M.A., Vargo, S.L., Lusch, R.F. (2013)	17
13	*Journal of Services Marketing*	Akaka, M.A., Vargo, S.L. (2015)	17
14	*Service Science*	Vargo, S.L., Akaka, M.A. (2012)	15
15	*MIS Quarterly*	Lusch, R.F., Nambisan, S. (2015)	15
16	*Journal of the Academy of Marketing Science*	Lusch, R.F., Vargo, S.L., Tanniru, M. (2010)	14
17	*Journal of Interactive Marketing*	Prahalad, C.K., Ramaswamy, V. (2004)	13
18	*Journal of the Academy of Marketing Science*	Maglio, P.P., Spohrer, J. (2008)	13
19	*Marketing Theory*	Lusch, R.F., Vargo, S.L. (2006)	13
20	*Journal of Business Research*	Meynhardt, T., Chandler, J.D., Strathoff, P. (2016)	13
21	*Journal of the Academy of Marketing Science*	Payne, A.F., Storbacka, K., Frow, P. (2008)	12
22	*Journal of Business Research*	Lusch, R.F., Vargo, S.L., Gustafsson, A (2016)	11
23	*Journal of Service Management*	Akaka, M.A., Vargo, S.L., Schau, H.J. (2015)	11
24	*Journal of Service Theory and Practice*	Koskela-Huotari, K., Vargo, S.L. (2016)	11
25	*Journal of Service Research*	Ordanini, A., Parasuraman, A. (2011)	10
26	*Marketing Theory*	Echeverri, P., and Skålén, P. (2011)	10
27	*Journal of Service Research*	Chandler, J.D., Lusch, R.F. (2015)	10
28	*Journal of Business Research*	Taillard, M., Peters, L.D., Pels, J., Mele, C. (2016)	10

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| 29 | *Journal of Service Research* | McColl-Kennedy, J.R., Vargo, S.L., Dagger, T.S., Sweeney, J.C., Van Kasteren, Y. (2010) | 10 |

Results

The analysis of multi-dimensional scaling (MDS)

The data were gathered from the most cited papers over two decades. Directing the co-citation matrix, the MDS analysis was applied to classify the subcategories in the identified study area (Van Eck et al., 2010). This analysis uses value co-citation as an indicator of closeness among the highly cited papers. The MDS indicates the harmony and definite themes between the papers. Papers with upper co-citation metrics contain the most important and closest shared subjects. It should be noted that MDS analysis was done with *IBM SPSS* to categorize data in a suitable model fit.

Ramos-Rodrigues and Ruiz-Navarro (2004), who determined the suitable model fit, suggested that it is considered a suitable fit when the stress value is between 0 and 1. The stress value was 0.06492, which is an excellent fit. Accordingly, the nominal stress value represents better results. Non-zero stress values occur in a position of low dimensionality. Hence, the dimensionality in the current paper is sufficiently utilizing standardized distance. The MDS analysis, which is considered 0.25, is divided into nine various groups. The MDS analysis considered groups 2, 3, 4, and 5 to be interrelated; similarly, groups 8 and 9 were interconnected. Groups 1, 2, 3, 5, 6, 7, 8, and 9 contained two papers, while group 4-included six papers. Groups 1, 6, and 7 had two papers that were deemed inaccessible to other groups. The following sections provide a detailed discussion of the groups.

Through the standardizing distance of 0.25, MDS analysis over the service ecosystem co-citation data could describe the most cited documents. Documents that are more conceptually close to each other are displayed in the related MDS analysis. Referring to the MDS results, nine proposed groups help scholars have a wide-ranging understanding of service ecosystems. To categorize subjects, we used the grouping suggested by Chabowski et al. (2010; 2013; 2018) and the naming groups suggested by Wilden et al. (2017 JSR). The groups are as follows: group 1 (A20 and A21): systematic value co-creation; group 2 (A1 and A15): S-D logic; group 3 (A15, A28): shared intentions; group 4 (A5, A8, A24, A25, A27 and A28): value co-creation; group 5 (A25, A26): interactive value; group 6 (A7 and A18): service structure; group 7 (A13 and A16): value-network; group 8 (A4, A12): service-for-service exchange; and, lastly, group 9 (A10 and A12): interactions' embeddedness and engagements.

The analysis of Hierarchical Cluster Analysis (HCA)

HCA is considered one of the most typical methods of bibliometric analysis, and it concentrates on the closeness of research studies regarding the subjects (Hair et al., 2014). Using HCA to create clusters, we implemented Ward's method (Reader and Watkins, 2006).

Figure 2 shows HCA analysis applying Ward's method. This analysis method created six clusters: cluster 1 (A5, A8, A24, A25, A27 and A28): value co-creation; cluster 2 (A1 and A15): S-D logic; cluster 3 (A7 and A18): service structure; cluster 4 (A13 and A16): value-network; cluster 5 (A4, A10 and A12): service ecosystem contextualization; cluster 6 (A20 and A21): systematic value co-creation. Six clusters were recognized using Ward's method: cluster 1 consists of six papers, cluster 5 contains three papers, whereas the other clusters consist of two papers.
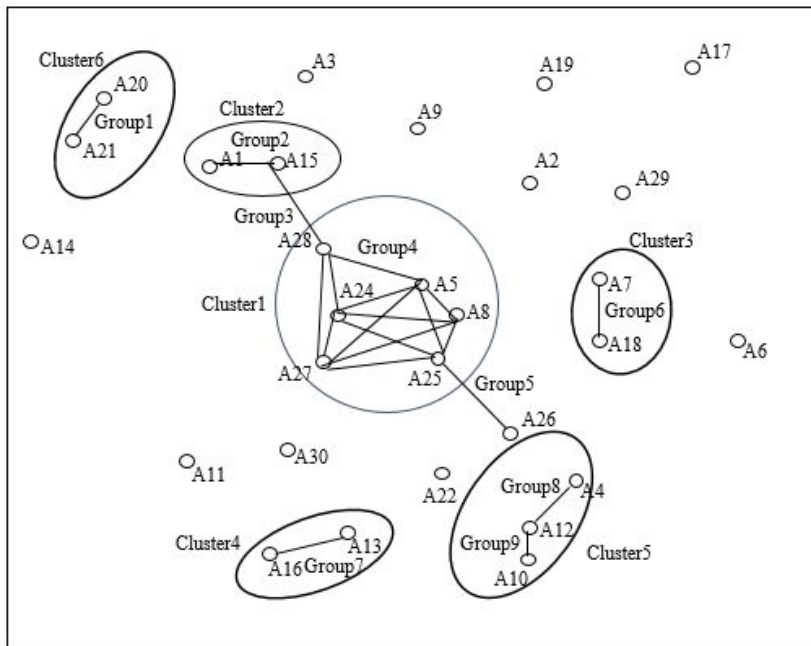
Figure 2: Service ecosystem knowledge

Notes: Ward's method
Stress value = .06492; Standardized distance = .25
A1= Vargo and Lusch (2004); A2= Vargo and Lusch (2016); A3= Vargo and Lusch, 2008; A4= Chandler and Vargo, 2011; A5= Edvardsson,Tronvoll, and Gruber, 2011; A6= Vargo and Lusch, 2017; A7= Vargo, Maglio, and Akaka, 2008; A8= Grönroos and Voima, 2013; A9= Vargo, Wieland, and Akaka, 2015; A10= Storbacka et al., 2016; A11= Edvardsson et al., 2014; A12= Akaka, Vargo and Lusch, 2013; A13= Akaka and Vargo, 2015; A14= Vargo and Akaka, 2012; A15= Lusch and Nambisan,2015; A16= Lusch, Vargo and Tanniru, 2010; A17= Prahalad and Ramaswamy, 2004; A18= Maglio and Spohrer, 2008; A19= Lusch and Vargo, 2006; A20= Meynhard, Chandler and Strathoff, 2016; A21= Payne, Storbacka and Frow, 2008; A22= Lusch, Vargo and Gustafsson, 2016; A23= Akaka, Vargo and Schau, 2016; A24= Koskela-Huotari, and Vargo, 2016; A25= Ordanini and Parasuraman, 2011; A26= Echeverri and Skålén, 2011; A27= Chandler and Lusch, 2015; A28= Taillard et al., 2016; A29= McColl-Kennedy et al., 2012
group 1 (A20 and A21): systematic value co-creation; group 2 (A1 and A15): service-dominant logic; group 3 (A15, A28): shared intentions; group 4 (A5, A8, A24, A25, A27 and A28): Value co-creation; group 5 (A25, A26): Interactive value; group 6 (A7 and A18): service structure; group 7 (A13 and A16): value-network; group 8 (A4, A12): service-for-service exchange and, lastly group 9 (A10 and A12): Interactions' Embeddedness and Engagements.

cluster 1 (A5, A8, A24, A25, A27 and A28): Value co-creation; cluster 2 (A1 and A15): service-dominant logic; cluster 3 (A7 and A18): service structure; cluster 4 (A13 and A16): value-network; cluster 5 (A4, A10 and A12): service ecosystem contextualization; cluster 6 (A20 and A21): systematic value co-creation.

Cluster 1 consists of Edvardsson et al. (2011), Grönroos and Voima (2012), Akaka et al. (2016), Koskela-Huotari and Vargo (2016), Echeverri and Skålén (2011), Chandler and Lusch (2015) with all six publications being precisely the same as any connection in MDS.

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Edvardsson et al. (2011) discussed service interchange development and value co-creation by considering S-D logic as a significant concept in social construction theories. Grönroos and Voima (2012) analyzed value co-creation in service by describing its roles and the company. Similarly, Akaka et al. (2016) enhanced customer experience by appreciating how value is made through markets. Koskela-Huotari and Vargo (2016) showed the requirements for more comprehensive, systematic, and multidisciplinary aspects in considering the effects of the resource "becoming" proceeding on the market formation through value co-creation and innovation. Echeverri and Skålén (2011) claimed that a collaborative value foundation is accompanied by value co-creation and value co-destruction. They recognized five collaboration value practices. In addition, Chandler and Lusch (2015) discussed the fundamental effect of value propositions in service systems. Overall, cluster 1 clarified the role that values co-creation plays in service systems.

Cluster 2 identified two articles, Vargo and Lusch (2004) and Lusch and Nambisan (2015). Vargo and Lusch (2004) were the first to introduce S-D logic in marketing. Service preparation rather than goods are critical to economic exchange. Similarly, Lusch and Nambisan (2015) offered a broader perspective on service innovation based on S-D logic. Hence, they suggested developing the S-D logic concept in research on service systems. Overall, cluster 2 mostly focuses on the role of S-D logic in service systems, such as service ecosystems.

Cluster 3 contains two articles, namely, Vargo et al. (2008) and Maglio and Spohrer (2008). Vargo et al. (2008) considered advancing service science by recognizing research questions about regulation and developing its correlation with economics and other service-based fields. Maglio and Spohrer (2008) explained several forms of service systems and developed the capability to design and measure advanced service systems. Thus, cluster 3 presents service systems and other service-oriented disciplines as part of service science.

Similar to clusters 2 and 3, *cluster 4* consists of two articles (Akaka and Vargo (2015) and Lusch et al. (2010)) that have the same relationships as those in MDS. Akaka and Vargo (2015) extended the service context beyond service encounters and service scopes conceptually by considering the service ecosystem concept.

Next, *cluster 5* consists of three articles, Chandler and Vargo (2011), Storbacka et al. (2016), and Akaka et al. (2013). Chandler and Vargo (2011) claimed that market levels (micro, meso, and macro) influence one another. Notably, they found the role of context in market co-creation through service providing. Storbacka et al. (2016) introduced a framework in a service ecosystem that intellectualizes actor engagement by delivering value co-creation at the micro-level. Then, they used the framework to detect research topics to guide future research. Akaka et al. (2013) mentioned an extended viewpoint that considers a framework to conceptualize context complexity that frames global exchange systems.

Finally, *cluster 6*, consists of two articles, namely, Meynhard et al. (2016) and Payne (2008), that have the same relationships as those in MDS. It provides systematic value co-creation to explore the nature of value co-creation and develops an intellectual framework to understand value co-creation management.

Multi-method comparison

Using a combination of MDS and HCA helps us to represent groups and clusters that result in an aligned perspective. The groups proposed through MDS mainly include value, value co-creation, and systematic value co-creation. Papers in MDS groups represent similarities related to service ecosystems. This implies that there is a relationship between most groups that exist within clusters. For instance, papers in group 1 MDS are generally related to systematic value co-creation, which is aligned with cluster 6 in HCA; group 2 MDS is the same as cluster 2 in HCA; group 4 MDS is aligned with cluster 1 in HCA; group 6 MDS is similar to cluster 3 in HCA; group 7 MDS is like cluster 4 in HCA, and groups 8 and 9 MDS refer to cluster 5 in HCA. The MDS analysis focuses on aggregate in groups 3, 5, 8, and 9, which propose the concepts of shared intentions, engagement, and interactive value related to service ecosystems. Also, HCA analysis was performed to provide a thorough understanding of the six clusters that describe all trends that service ecosystems can develop.

Discussion and suggestions

By investigating the 29 most cited papers in the service ecosystem area, we aimed to find a central intellectual structure in this area. In addition, by following previous scholars (Chabowski, 2010, 2013, 2018; Chabowski and Mena, 2017; Shin, 2022; Vink et al., 2021), we reviewed the most recent articles in the field and incorporated the main subjects of the most recent articles into a future model. Simultaneously, various bibliometric approaches (e.g., MDS and HCA) allowed us to have a strong perspective. This study aims to help scholars with their future studies in this field. Thus, to develop the scope of future insights into service ecosystems, we reviewed the most-cited articles written between 2004 and 2022 (see Appendix 2). This progression recognizes movements and extensions in the service ecosystem area and the recent major trends. While offering the forthcoming model, the most recent papers have been discussed. Also, to improve the research area, probable future questions have been addressed further.

The proposed framework (see Figure 3) is based on the fundamental approaches employed in the most recent papers. Through the concepts mentioned in these papers, we can conclude that the idea of service ecosystems is a highly dynamic approach with a parallel nature with structures consisting of relationships among members who play various roles in different levels of influence. Members of an ecosystem grow and suffer together (O'Connor and Cook, 2020). Hence, service ecosystems enter a new era in which technologies, service providers, and customers play the primary role in creating, disseminating, and sharing information. The collaboration among actors and the information resources are the main factors for the admission/rejection of innovations (Brodie et al., 2016; Hakala et al., 2020, McColl-Kennedy et al., 2017).

As mentioned, the purpose of this paper is to offer a bibliometric review of the service ecosystem and so provide a conceptual model that demonstrates the assumptions, key processes, and performance efficiencies in service design. In this way, the efforts of system actors are purposeful and lead to the creation of sustainable values in performance and the

development of practical approaches from the service ecosystem viewpoint. The critical sectors of the service ecosystem literature utilize source-based models that influence the bibliometric approach to propose an integrated framework for further service ecosystem trends.

New service requirements

Based on the theoretical framework (Figure 3), we identified *new service requirements* in cluster 1 and the main viewpoints considered in service ecosystems (Table 1) as one of the original conceptualized items that affect the service ecosystem structure through three dimensions. The first dimension is an *in-depth exploration of attitudes and behaviors* mentioned in the most recent articles about service ecosystems (Appendix 2). Our research shows that customer behavior is caused by their attitude toward the organization (Pansari and Kumar, 2017; Petersen et al., 2018; Bergel et al., 2019). This raises the following questions: How do the behaviors and attitudes related to the structure of service ecosystems play an important role in understanding the basic needs of a service ecosystem? And should attitudes and behaviors first be examined to understand how the ecosystem can be adjusted and coordinated to meet the multiple needs of customers? Hence, managers interested in benefiting more from customer interaction should consider the need for greater mutual understanding between individuals and the organization's structure in the service ecosystem. Therefore, marketing researchers focus primarily on an in-depth exploration of customer attitudes, behaviors, and experiences.

On the other hand, service ecosystems should potentially remove obstacles and provide a suitable condition in which researchers can explore attitudes and behaviors through *actors' experiences*. Considering the attitudes and behaviors of actors in a service ecosystem (e.g., tourists or tourism operators in the tourism context) helps decision-makers become involved in co-creation and in fulfilling customer needs. The results of these co-creation processes lead to the ecosystem's success in increasing access for actors (Cassia et al., 2020). In this way, questions that could be raised in future studies are as follows: How does an in-depth exploration of attitudes and behaviors affect service ecosystem structure through balancing geographic networks? How does an in-depth exploration of attitudes and behaviors affect the service ecosystem structure through cultural differences? And how does an in-depth exploration of attitudes and behaviors affect the service ecosystem structure through customer proximity?

The second dimension in new service requirements is *actors' experience management strategies*, which are referred to in the most recent service ecosystem articles (Appendix 2). Embracing and developing various experience management strategies should benefit the actors. Research into service ecosystems should explore actors' experience management strategies (Story et al., 2020), as these are the most promising marketing approaches, especially in customer service. What is essential in this area is to use the dynamics of customer experience management strategies to determine the appropriate structure of the customer service ecosystem. Experience providers develop different management strategies over time by creating different strategies, using different actors, processes, and resources, and

forming different goals. Therefore, the purpose of presenting this component in the model is to identify the best combination of effective strategies for the organization according to the performance of the actors' experience in the organization. So, future research could explore questions such as How do actors' experience management strategies affect the service ecosystem structure through balancing geographic networks? How do actors' experience management strategies affect the service ecosystem structure through cultural differences? And how do actors' experience management strategies affect the service ecosystem structure through customer proximity?

The last dimension of the new service requirement is *complaint contagion strategies;* these are explained in the most recent articles in the service ecosystem (Appendix 2) as one of the main viewpoints considered in the service ecosystem literature (Table 1) and the conceptual foundations of the service ecosystem field. It is essential to investigate conditions for contagion complaints to identify customers' perceived characteristics. In other words, the status of contagious complaints that reflect the perceived characteristics of the customer should be examined. Searching for anti-grievance strategies, such as personal influences or secret collaboration between a service provider and a dissatisfied customer, prevents further grievances from the organization (Chen et al., 2020). The constructs mentioned above are the antecedents of the service ecosystem structure to determine the levels and dimensions that participate in the service ecosystem structure. Therefore, it is essential for future research to find answers to the following questions: How do complaint contagion strategies affect the service ecosystem structure by balancing geographic networks? How do complaint contagion strategies affect the service ecosystem structure through cultural differences? And how do complaint contagion strategies affect the service ecosystem structure through customer proximity?

Accelerating servitization and perceived well-being as moderators

The importance of *accelerating servitization dimensions* consists of *geographic network balance, cultural differences,* and *customer proximity* mentioned in the most recent articles in the service ecosystem (Appendix 2). They are appropriate dimensions that should be considered as *accelerating servitization* moderators (Bustinza et al., 2019). Evidence suggests that choosing the proper organizational configuration is related to the specific characteristics of each geographic market (Hsieh et al., 2019; Kowalkowski et al., 2011). Communication technologies have also enabled businesses to expand market opportunities faster and to pre-identify and use them. (Watson, 2018). In other words, the evolution of organizational forms and the use of various technologies in global markets is expanding. Therefore, platform-based companies have formed around the world to facilitate and accelerate interactions by facilitating transactions between buyers and sellers (Nam and Kannan, 2020; Ojala et al., 2019; Stallkamp and Schotter, 2021).

The *cultural differences* also represent the grand vision of the organization, which is widely used in service and digital markets. The globalization of economic activities creates challenges for marketers, including providing solutions tailored to the specific needs of different countries and cultures. What is important is that cultural differences have led to

greater acculturation and cultural pluralism both physically and digitally between different communities in global markets (Donthu et al., 2021; Griffith et al., 2021). Therefore, scholars suggest that future studies should consider the importance of geographic network balance, cultural differences, and customer proximity to accelerate service delivery (Bustinza et al., 2019; Jovanovic and Morschett, 2022; Yu, 2021).

Another moderator is *perceived well-being*, which is defined at a system level as "a holistic, dynamic, positive state" (Frow et al., 2019, p. 2667) and "an aggregated perspective of nested actor's assessment of a system's present conditions in terms of fulfilling its needs and contributing to the betterment of itself" (Leo et al., 2019, p. 770). The service ecosystem perspective of co-creation created by *well-being* entails active interaction between actors and available resources at various system levels. Innovative behaviors must be learned to maintain the well-being of the service industry, and new developments must be provided for the social order (Finsterwalder and Kuppelwieser, 2020). Transformative service research designs a discipline that proposes a unique perspective (Anderson et al., 2018) to enhance people's feelings of well-being. Well-being entails various life areas: mental, physical, social, spiritual, political, economic, and material (McGregor and Goldsmith 1998; Mick et al. 2012; World Health Organization, 2020). Therefore, marketers and policymakers should consider perceived cores of well-being if people choose a mixture of products to respond to their needs (Hill, 2001).

Service ecosystem structure

The concept of a *service ecosystem structure* mentioned in group 6 and cluster 3 has detailed levels and structures in group 9 with the main viewpoints about service ecosystems (Table 1), and the most recent articles in the field of service ecosystems (Appendix 2). Also, the logic of service ecosystems is based on the S-D logic declared in group 2 and cluster 2. The service ecosystem structure consists of actors, processes, materials, and purposes (Vink et al., 2021). Actor involvements are proposed in a micro-system, which should be based on an expert-driven approach managed by designers, managers, staff, and service users in service design. In this way, a service ecosystem provides a collective designing context through all the actors. Process building blocks in a mesosystem include designing in-use and new service development. From a service ecosystem viewpoint, processes should have an embedded feedback loop of reformation and reflexivity. An exo-system contains materials that should be designed through touchpoints and interfaces that link consumers to the service design business. Designing materials in a service ecosystem is based on institutional management and their physical performances. Finally, in the macro-system, the purposes are developing new services and providing the conditions for value in service design. The purpose of shifting to a service ecosystem design is to allow the advent of anticipated forms of value co-creation in business.

Service performance

The consequence of the service ecosystem structure is that it should lead managers to achieve *service performance* and its dimensions, as confirmed in the main viewpoints considered in service ecosystems (Table 1), the summary of the most significant theoretical viewpoints in

service ecosystems (Table 2), and the most recent articles about service ecosystems (Appendix 2). By considering the proper position in the service ecosystem structure, managers and policymakers can achieve service performance dimensions. Developing a comprehensive and humanistic approach to understand more details of social collaborations and progressions in the *humanistic approach (social service ecosystem)* is given more consideration than previously to achieve service performances. Besides, financial well-being is an essential concept in service performance, as its absence can harm psychological, physical, emotional, social, and other scopes of human well-being (Desmond, 2017). Therefore, designing and evaluating a social service ecosystem that can meet consumer needs other than material, social, and environmental benefits seems crucial (Baker et al., 2015). So, questions that could be explored in future research are as follows: How does the structure of the service ecosystem affect service performance? How does it influence the humanistic approach? And how might it impact the humanistic approach through perceived well-being?

Also, conceptualizing the dissemination of user innovations from a service ecosystem perspective is of immense importance. This process will lead to co-creation in nested service ecosystems and between overlapping service ecosystems by the innovative diffusion of systemic institutional retention, change, and disruption (Vargo et al., 2020). Therefore, it is essential to understand how service ecosystems and organizational lenses can be used to conceptualize diffusion in an overall innovation process. Furthermore, this understanding also shows how user innovation can contribute to *sustainable innovation* (Trischler et al., 2020). Due to the service ecosystem structure proposed in the model (Figure 3), in particular, the actor-to-actor orientation helps to create innovation in the service ecosystem. Thus, systematic perspectives as high-quality research disciplines from papers published in order to get a comprehensive view of the subject, such as the service ecosystem, can integrate innovations and disseminate practical and sustainable innovations (Vrontis et al., 2021; Vrontis et al., 2022). The service vision defines the dissemination of innovation as an evolving process that relies on resources to integrate service ecosystem actors and create value. Therefore, to achieve sustainable innovation, service providers and users must create sustainable innovation activities through appropriate partnerships. We recommend authors explore questions such as How could the service ecosystem structure affect sustainable innovation? And how could the service ecosystem structure affect sustainable innovation through perceived well-being?

Besides, the relevance of existing service design methods should be evaluated in line with crucial service ecosystem design processes to develop innovative approaches to service design that focus on good *reflectivity and renovation* in various settings. Actors aim to achieve a purposeful, long-term modification in service systems by understanding service design (Vink et al., 2020). Notably, it is important to consider the service capabilities provided within the organization and the capabilities that should be outsourced to expert partners working in multinational organizations. This is because it has a significant impact on maximizing organizational performance and achieving commercial objectives. Therefore, it is necessary to answer questions such as: How could the service ecosystem structure affect

reflexivity and reformation? And how could the service ecosystem structure affect reflexivity and reformation through perceived well-being?

Metaverse Service Ecosystem

The digital era has profoundly transformed traditional service definitions (Choi and Kim, 2017). With the rapid advancements in technology, including the rise of blockchains and related technologies, the metaverse's expansion has been expedited (Huynh-The et al., 2023; Kraus et al., 2022). The metaverse is an amalgamation of a three-dimensional virtual world, augmented reality (AR), lifelogging, and mirror worlds (Kim, 2021), populated by digital natives and avatars (Koohang et al., 2023). It aims to offer novel experiences to its audience (Schöbel and Leimeister, 2023).

Virtual reality (VR) integrates the latest developments in computer graphics, multimedia, artificial intelligence, multi-sensor technology, networks, parallel processing, and more, achieving true interactivity (Harfouche et al., 2022). In contrast, the virtual world is a computer-generated communal space where users engage with one another (Oleksy et al., 2023). AR, evolving from VR's foundation, employs location-based technology and networks (Li et al., 2023). It overlays computer-generated virtual objects, scenes, or instantaneous information on real-world visuals, enhancing real-world perceptions (Wei et al., 2023). Lifelogging, an extension of virtual world systems, utilizes technology to gather, accumulate, and present daily experiences and information about avatars and other entities (Kim, 2021). A mirror world in the metaverse mimics every aspect of the real world within a virtual environment (Koo et al., 2022). The metaverse facilitates the coexistence of real and virtual ecosystems and their interrelations based on digital twins — digital representations crafted for institutions, processes, and products/services.

As previously mentioned, the service ecosystem structure comprises actors (micro-system), processes (mesosystem), materials (exo-system), and purposes (macro-system) (Vink et al., 2021). The metaverse can be segmented into: (1) the virtual world as a shared environment (mesosystem), (2) the utilization of avatars (micro-system), (3) synchronized features (exo-system), (4) an interoperable environment (exo-system), and (5) user experience which is interactive, immersive, and social (macro-ecosystem) (Kim, 2021). Actors in the metaverse ecosystem include platform providers and feature providers such as avatar technology, economy, and infrastructure specialists (Zabel et al., 2023). Given that service provision is a foundational block of the metaverse (Kar and Varsha, 2023), integrating the "metaverse" concept with the "service ecosystem" gives rise to the "metaverse service ecosystem". This hybrid system enables simulations of tangible service environments like hotels or brick-and-mortar stores and entertainment realms like gamified experiences in the virtual domain (Dwivedi et al., 2023). These simulations enhance service efficiency and client satisfaction (Kar and Varsha, 2023). Merging these elements with intelligent technologies, such as the metaverse, can elevate customer experiences and loyalty, and bolster communication between service providers and avatars (Wei, 2022), thus amplifying service performance (Kar and Varsha, 2023). This gives rise to key questions: How does the metaverse reshape the

structure, processes, materials, and objectives of the service ecosystem? How will the metaverse influence service design?

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Accelerate Servitization

Balancing geographic networks

Cultural differences

Customer proximity

New Service Requirements

In-depth exploration of attitudes and behaviors

Actors' experience management strategies

Prevent complaint contagion strategies

Service Ecosystem

Metaverse Service Ecosystem

Purposes

Materials

Processes

Actors

Macro-system

Meso-system Exo-system

Micro-system

Digital Twins

Platforms

Avatars

Metaverse Experiences

Perceived well-being

Service Performance

Service performance

Sustainable innovations through innovation diffusion

Reflexivity and reformation

Metaverse
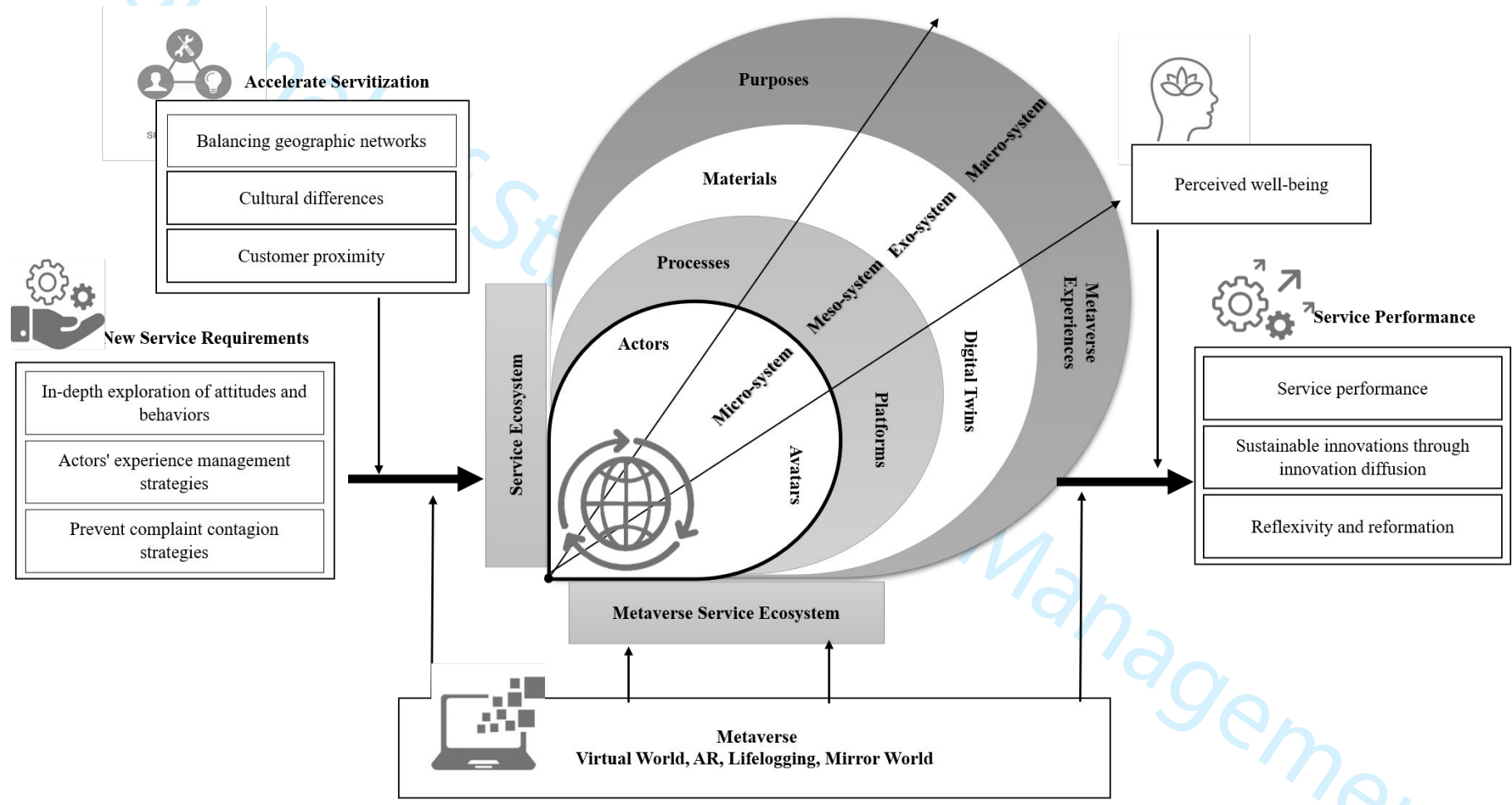**Virtual World, AR, Lifelogging, Mirror World**

Figure 3: A proposed framework for the service ecosystem

Limitations

As with all research, the current study has some limitations. The papers were extracted from the SCOPUS database and only one specific keyword was used: "service ecosystem." Using different keywords could lead to the retrieval of many papers that have not been considered in this study. Subsequently, MDS results depend on the most frequently cited papers. Any change in the trial affects the essence of the outcomes. If the variation is essential, the outcomes of MDS and HCA will be significantly different. As there is only one database for research drives, it is suggested that future scholars study another database such as Web of Science. For example, they could compare their results with the results of the present study. Furthermore, though MDS and HCA analysis is widely applied in the bibliometric evaluation of a scientific study domain, other bibliometric assessment methods may reveal different items. We suggest that future studies use various bibliometric techniques, like EFA (Exploratory Factor Analysis), to consider another research area. Additionally, to obtain an extensive appreciation of the research area, further studies could also assess various visualization software, such as Pijek. Applying a one-approach software could unify the published papers in this research area. Therefore, the results can provide subsidiary and exciting information for the improvement of service ecosystems. Finally, as scholars have not expanded the work in this research area, future scholars might wish to carry out a framework analysis containing the latest research regarding service ecosystems.

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Appendix 1: Summary of highly cited papers

Authors	Source	Article name	Motivation	Objectives	Keyword/ Keyword Plus	Theories/ concepts	Methodology	Analysis
Vargo and Lusch (2004)	Journal of Marketing	Evolving to a New Dominant Logic for Marketing	To explore the evolving logic and the corresponding shift in perspective for marketing scholars, marketing practitioners, and marketing educators	To form a new dominant logic for marketing, one in which service provision rather than goods is fundamental to economic exchange	NA	service-dominant logic/ marketing theory/ resource advantage theory/ core competency theory/	NA	NA
Vargo and Lusch (2016)	Journal of the Academy of Marketing Science	Institutions and axioms: an extension and update of service-dominant logic	To facilitate a better understanding of cooperation (and coordination), an eleventh foundational premise (fifth axiom) is introduced, focusing on the role of institutions and institutional arrangements in systems of value co-creation: service ecosystems	(1) further, update the existing FPs of S-D logic, (2) highlight the concept of service ecosystems to identify the role of institutions, (3) briefly review institutional theory in marketing and other social science literature, (4) explore the role of institutions in the S-D logic framework, (5) point toward future directions for S-D logic theory development and research	ecosystems; institutions; S-D logic; theory	S-D logic/ institutional theory	NA	NA
Vargo and Lusch (2008)	Journal of the Academy of Marketing Science	Service-dominant logic: continuing the evolution	To provide a foundation for a general theory of marketing. Panning back slightly, it could provide a similar foundation for a general theory of the market,	To highlight and clarify the salient issues associated with S-D logic and updates the original foundational premises (FPs)	new-dominant logic; service; service-dominant logic	service-dominant logic/ marketing theory/ consumer culture theory	NA	NA

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			which we believe would be an even more solid basis for a general theory of marketing than the economic science foundation found presently	and adds an FP			
Chandler and Vargo (2011)	Marketing Theory	Contextualization and value-in-context: How context frames exchange	how market levels (micro, meso, and macro) influence one another.	To explore the role of context in service provision and, more broadly, in market co-creation	service-dominant logic; value networks; value-in-context; value-in-use	theory of the growth of the firm	NA NA
Edvardsson, Tronvoll, and Gruber (2011)	Journal of the Academy of Marketing Science	Expanding understanding of service exchange and value co-creation: a social construction approach	To develop and describe a new framework for understanding how the concepts of service exchange and value co-creation are affected by recognizing that they are embedded in social systems	To expand understanding of service exchange and value co-creation by complementing the central aspects of S-D logic with key concepts from social construction theories (social structures, social systems, roles, positions, interactions, and reproduction of social structures)	service exchange; service system; service-dominant logic; social construction theories; social interaction; structuration theory; value co-creation	structuration theory	NA NA
Vargo and Lusch (2017)	International Journal of Research in Marketing	Service-dominant logic 2025	S-D logic can continue to advance over the next decade by moving toward further development of a general theory of the market and, even more broadly, to a general theory of value co-creation	To suggest that, for S-D logic to move forward over the next decade, it needs more midrange theory development, as well as evidence-based research	ecosystem; institutions; S-D logic; service-dominant logic; theory	the general theory of the market/ micro-level theory/midrange theory development/meta-theory development	NA NA

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Vargo, Maglio, and Akaka (2008)	European Management Journal	On value and value co-creation: A service systems and service logic perspective	To implicate for advancing service science by identifying research questions regarding configurations and processes of value co-creation and measurements of value-in-use, and by developing its ties with economics and other service-oriented disciplines	To take the view of (1) service, the application of competencies is the underlying basis of exchange; (2) the proper unit of analysis for service-for-service exchange is the service system propositions; and (3) service science is the study of service systems and the co-creation of value	service science; service system; service-dominant logic; value co-creation; value-in-exchange; value-in-use	NA	NA	NA
Grönroos and Voima (2013)	Journal of the Academy of Marketing Science	Critical service logic: Making sense of value creation and co-creation	To conceptualize value creation spheres extends knowledge about how value-in-use emerges and how value creation can be managed; it also emphasizes the pivotal role of direct interactions for value co-creation opportunities	To analyze value creation and co-creation in service by analytically defining the roles of the customer and the firm, as well as the scope, locus, and nature of value and value creation	interaction; marketing; service logic; service-dominant logic; value co-creation; value creation; value spheres	value theory	NA	NA
Vargo, Wieland, and Akaka (2015)	Industrial Marketing Management	Innovation through institutionalization A service ecosystems perspective	To broaden the scope of innovation beyond firm-centred production activities and collaboration networks, and emphasizes the social practices and processes that drive value creation and, more specifically, innovation, the combinatorial evolution of new, useful knowledge	To explore the role of institutions in innovation from a service-ecosystems perspective, which helps to unify diverging views on innovation and extend the research regarding innovation systems	ecosystems; institutions; market innovation; service-dominant logic; technological innovation	structuration theory	NA	NA
Storbacka et al. (2016)	Journal of Business Research	Actor engagement as a micro foundation for value co-creation	To identify research issues for actors, engagement platforms, actor disposition, engagement properties, and resource	(1) to develop a framework that conceptualizes actor engagement as a micro foundation of value co-creation	actor engagement; co-creation of value; micro-	practice theory	NA	NA

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			integration patterns		within a service ecosystem, (2) to use this framework to identify research issues to guide future work	foundation; service ecosystems		
Edvardsson et al. (2014)	Marketing Theory	Institutional logics matter when coordinating resource integration	To know about the systemic nature of resource integration and the ways the activities of resource integrators are coordinated and adjusted to each other	To provide a framework and a structure for identifying and analyzing the influence of institutional logics on resource integration in service systems	institutions; institutional logics; resource integration; service logic; service system; value assessment; value co-creation	institutional theory	NA	NA
Akaka, Vargo and Lusch (2013)	Journal of International Marketing	The complexity of context: A service ecosystems approach for international marketing	To introduce the concept of "value in cultural context" to emphasize the influence of the symbolic and social components of context	To propose a framework for conceptualizing the complexity of the context that frames international and global exchange systems	institutions; marketing theory service-dominant logic, service ecosystems, value co-creation	NA	NA	NA
Akaka and Vargo (2015)	Journal of Services Marketing	Extending the context of service: from encounters to ecosystems	To offer a dynamic perspective of service context to help further the reach of services marketing research by extending the context of service across a variety of exchange encounters and pointing toward institutions as a central influence on phenomenological views of experience	To extend the context of service beyond service encounters and service scapes conceptually by applying a service-ecosystem approach to the context and experiential view on the value	co-creation; context; institutions; service ecosystem; service experience; service-dominant logic	NA	NA	NA

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Vargo and Akaka (2012)	Service Science	Value Co-creation and Service Systems (Re)Formation: A Service Ecosystems View	To explores S-D logic, service-ecosystems approach to studying value co-creation and the (re)formation of service systems	To outline the central premises of S-D logic and elaborate the concept of a service ecosystem to propose a framework that focuses on resource integration as a central means for connecting people and technology within and among service systems	resource integration; service-dominant logic; theory and principles; transformation and innovation; value co-creation	systems theory/ structuration theory	NA	NA
Lusch and Nambisan (2015)	MIS Quarterly: Management Information Systems	Service innovation: A service-dominant logic perspective	To consider the role of information technology both as an operand resource and as an operant resource	To offer a tripartite framework of service innovation: (1) service ecosystems, (2) service platforms, and (3) value co-creation	architecture; collaboration; ecosystems; institutions; platforms; resource integration; S-D logic; service innovation; value co-creation	NA	NA	NA
Lusch, Vargo and Tanniru (2010)	Journal of the Academy of Marketing Science	Service, value networks, and learning	To develop new research opportunities for marketing and supply chain management scholars and identify opportunities for organizations to improve their ability to serve customers, other partners in the value network, and their organization by adopting a service-dominant orientation	To (1) apply S–D logic thinking to move marketing and SCM toward a focus on service provision, in which goods are seen as service distribution or provisioning mechanisms, (2) explore and elaborate the concept of a value network, (3) develop a model which theorizes how a firm can learn to become an essential service provisioning part of a complex and adaptive value network	infomediaries; information technology; learning; resources; service; service-dominant logic; supply chain management; value networks	NA	NA	NA

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Prahalad and Ramaswamy (2004)	Journal of Interactive Marketing	Co-creation experiences: The next practice in value creation	To discuss how a market concept is undergoing change and transforming the nature of the relationship between the consumer and the firm.	To explain the paradox of customer dissatisfaction to with having more choices of products and services than ever before, and investment of firms in greater product variety but are less able to differentiate themselves	NA	NA	NA	NA
Maglio and Spohrer (2008)	Journal of the Academy of Marketing Science	Fundamentals of service science	To categorize and explain the many types of service systems that exist as well as how service systems interact and evolve to co-create value	To apply scientific understanding to advance the ability to design, improve, and scale service systems	service science; service systems; service-dominant logic	NA	NA	NA
Lusch and Vargo (2006)	Marketing Theory	Service-dominant logic: Reactions, reflections, and refinements	To approach collaboratively and welcome both elaborative and critical viewpoints	To identify and participate in what authors see as an evolving new dominant logic of marketing, one that will emerge with or without their involvement	S-D logic; marketing theory; relationship marketing; resource integration; resource theory; service marketing; service-dominant logic	NA	NA	NA
Meynhard, Chandler and Strathoff (2016)	Journal of Business Research	Systemic principles of value co-creation: Synergy of value and service ecosystems	To propose a framework that begins to unravel the complexity of value co-creation and the dynamics of service ecosystem evolution	To introduce nine systemic principles of value co-creation: critical distance, stability, amplification, internal determination, nonlinearity and feedback, phase transitions, service-	public value; self-organization; service ecosystems; service-	theory of synergy	NA	NA

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				symmetry-breaking, limited predictability, and historical dependence	dominant logic; synergy; value co-creation			
Payne, Storbacka and Frow (2008)	Journal of the Academy of Marketing Science	Managing the co-creation of value	To provide a structure for customer involvement that takes account of critical foundational propositions of S-D logic and places the customer explicitly at the same level of importance as the company as co-creators of value	To explore the nature of value co-creation in the context of S-D logic, develop a conceptual framework for understanding and managing value co-creation, and utilize field-based research to illustrate the practical application of the framework.	co-creation; co-production; service-dominant logic; value	experiential consumption research/ consumer culture theory	NA	NA
Lusch, Vargo and Gustafsson (2016)	Journal of Business Research	Fostering a trans-disciplinary perspective of service ecosystems	To integrate some of the ideas presented and share some observations and suggestions on resource integration, value co-creation, institutions, and service ecosystems	To provide a brief introduction and comments on the articles in this special issue on transdisciplinary perspectives of service-dominant logic	co-creation; ecosystems theory; service-dominant logic; trans discipline	institutional theory/ mid-range theory/ complexity theory/ practice theory	NA	NA
Akaka, Vargo and Schau (2016)	Journal of Service Management	The context of experience	To enhance customer experiences by better understanding how value is created and realized through markets	To extend the context of experience to include 1) Sign systems and service ecosystems, 2) multiplicity of structures and institutions, 3) value-in cultural-context, and 4) co-construction of context.	NA	consumer culture theory (CCT)	NA	NA

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Authors	Journal	Title	Aim 1	Aim 2	Keywords	Theory/Perspective	Method	Analysis
Koskela-Huotari, and Vargo (2016)	Journal of Service Theory and Practice	Institutions as resource context	To highlight the contextual nature of resources through how "new" resources "become" from existing resources through a combinatorial process	To examine institutions' role and institutional complexity in the process through which resources-in-context get their "resources."	institutional complexity; institutions; resources-in-context; service ecosystems; value co-creation	service ecosystems perspective/ institutional theory	Theoretical approach	NA
Ordanini and Parasuraman (2011)	Journal of Service Research	Service innovation viewed through a service-dominant logic lens: A conceptual framework and empirical analysis	To build on and extend extant innovation research by proposing and empirically testing a framework.	To invoke insights from the emerging S-D logic perspective and propose a conceptual framework for investigating the antecedents and consequences of service innovation	service innovation; service-dominant logic	service-dominant logic	Case study: sampling, 193 five-star luxury hotels in Italy	component factor analysis (CFA)
Echeverri and Skålén (2011)	Marketing Theory	Co-creation and co-destruction: A practice-theory-based study of interactive value formation	To draw on a detailed empirical study of interactions between the frontline employees and their customers	To outline a framework that explains how interactive value formation takes place in practice. Also, to identify five interaction value practices – informing, greeting, delivering, charging, and helping.	co-creation; co-destruction; interactive value formation; marketing; practice theory; praxis; subject positions; value	practice-theory	Qualitative: an exploratory single-case study	NVivo 7 being used as the data analysis software
Chandler and Lusch (2015)	Journal of Service Research	Service Systems: A Broadened Framework and Research Agenda on Value Propositions, Engagement, and Service Experience	To shed light on the fundamental role that value propositions play in service systems	To propose a framework that explores how and why actors, whether inadvertently or subconsciously, engage or disengage with one another.	engagement; service experience; service systems; service-dominant logic; value propositions	marketing and structuration theory	Theoretical approach	NA

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9	Taillard et al. (2016)	Journal of Business Research	The role of shared intentions in the emergence of service ecosystems	To address how service ecosystems are formed and what role individual and collective agency play in this process.	To introduce the concept of shared intentionality, an aspect of a collection agency whose specific conditions result from and foster interdependence among actors and acknowledge the mediating role of the meso level in emergence.	agency; emergence; service ecosystems; shared intentions	NA	Theoretical approach	NA

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26	McColl-Kennedy et al. (2012)	Journal of Service Research	Health Care Customer Value Co-creation Practice Styles	To show how customers can contribute to their value creation through their own (self) activities in managing their health care	1) to investigate health care customer value co-creation empirically, identifying what customers do when they co-create value; 2) to begin to explore the relationship between health care customer co-creation of value practice styles and desired outcomes; 3) to provide a typology of health care CVCPS.	coproduction; health care; practice styles; value; value co-creation	consumer culture theory (CCT) and social practice theory	focus groups: 20 and in-depth interviews	interpretive analysis/ manual thematic analysis

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Appendix 2. Explanation on the most recent articles in the service ecosystem

Authors	Source	Research questions	Keywords	Theories	Methodology	Analysis	Future research suggestions
Palmié et al. (2022)	Technological Forecasting and Social Change	How are "brick-and-mortar" retailers innovating their business models and making the transition towards digital business models?	Digital business model; Digital business model innovation; Digital service; Digital transformation; Digitization; Ecosystem; Ecosystem emergence; Retail	NA	qualitative analysis	NA	Future research should study the link between external relationships and digital business model innovation in other sectors and countries. Scholars could also explore the effect of specific digital technologies (such as artificial intelligence) on firms' external relationships.
Dalenogare et al. (2022)	Technological Forecasting and Social Change	How does this combination of digital transformation and Smart PSS help expand the organizational information-processing theory in the innovation ecosystems' domain?	Digital ecosystems; Digital Servitization; Digital technologies; Smart Product-Service Systems (PSS)	organizational information-processing theory	survey of 92 manufacturers	regression analyses	Future research opportunity is to study customer experience and loyalty for customized solutions when a Smart PSS is provided in an ecosystem approach
Grinstein et al. (2022)	Journal of International Marketing	Is it the discipline that "is used to create and sustain the power of multinational corporations? Promoting the consumerism that is ruining our world? The never-ending advertising efforts to convince people to buy things they do not need?"	NA	NA	Descriptive Analysis	NA	Highlight opportunities for international marketing practitioners and scholars to work together to understand and address pressing societal challenges.
Gölgeci et al. (2022)	Journal of Business & Industrial Marketing	1. What is the interplay between major research themes in service ecosystems research? 2. How has research on	Service ecosystems; Bibliometric review; Systematic literature review; Service	Grounded Theory	bibliometric review	VOSviewer and R-package and content analysis	Future research may also attempt with the alternate analysis tool, such as co-citation, to generate clusters.

		service ecosystems evolved over the past twenty years? 3. What are the methodological developments in exploring service ecosystems? 4. Which are the predominant underpinning theories on service ecosystems research? 5. What are the opportunities for more impactful research in the field?	dominant logic				
Mattison Thompson and Brouthers (2021)	Journal of International Marketing	The impact on online advertising clicking and sharing engagement or how within-country cultural variation (tightness/looseness) moderates this activity.	Digital Consumer Engagement, Digital Business, Sharing, Clicking, Cultural Values, Cultural Tightness/Looseness, platforms, online	NA	Descriptive Analysis	SPSS	Future research efforts could examine whether there is a cause-effect relationship and determine the drivers behind such engagement activities.
Kolagar et al. (2021)	Journal of Service Management	how digital servitization enables SME internationalization by demonstrating how the development of digital service offerings and ecosystem partnerships supports the	Internationalization, SMEs, Digital servitization, Digital service maturity, Business ecosystem, Ecosystem involvemen	NA	case study	coding	Future studies could explore additional paths or identify criteria and capabilities, such as AI.

			internationalization process.				
Finsterwalder, Kuppelwieser (2020)	Journal of Service Management	How can a service ecosystem better prepare for (pre-incident phase), respond to (incident phase), recover from (post-incident phase), and build resources to become resilient to future critical incidents?	COVID-19; Coronavirus; crisis; disaster; pandemic; research agenda; resilience; resources-challenges equilibrium framework; service ecosystem well-being; social distancing; transformative service research	NA	NA	NA	To understand customer needs and behavior as well as repercussions for businesses during critical incidents and to draft and (re-)design future co-creative encounters and services
Cassia et al. (2020)	TQM Journal	What is the assessment of digital ecosystems' potential to remove the identified barriers and allow effective, accessible tourism experience co-creation?	accessible tourism; digital ecosystems; perceived quality; service ecosystems	NA	NA	NA	To provide an in-depth exploration of the attitudes and behaviors of digital ecosystems' actors (e.g., tourists, tourism operators) and assess the drivers of their willingness and disposition to engage in co-creation. Then, evaluate the outcomes of these co-creation processes. Finally, provide a comprehensive framework of the factors influencing digital ecosystems' success in fostering accessible tourism.
Baker et al. (2020)	Journal of Public Policy and Marketing	When does the social service ecosystem meet consumption needs?	consumption; marketing systems; service ecosystems; social services; well-being	social service ecosystem through a resource-based or dyadic perspective	In-depth interviews with 45 rural and urban recipients	Thematic Interpretation	This study suggests developing and applying a more holistic (and humanistic) approach to capture nuances inherent in the social interactions and processes that occur in and around the social service ecosystem.

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Trischler et al. (2020)	Journal of Business Research		How can the diffusion of user innovations be conceptualized from a service ecosystem perspective?	Diffusion; innovation ecosystem; service ecosystem; sustainability; user innovation	NA	NA	NA	Future research is needed on the question of whether user innovations meaningfully contribute to sustainable innovations.
Story et al. (2020)	Journal of Business Research		How and when might supporting actors benefit from adopting different experience management strategies that are developed?	Actor visibility; customer experience management strategies; ecosystem synchronization; supporting actors	NA	NA	NA	Future research could explore the experience management strategies of other types of actors in a service ecosystem.
Sezer, Bosch-Sijtsema (2020)	International Journal of Construction Management		How can tensions and barriers between actors within the service ecosystem of Construction and Demolition Waste (CDW) be investigated for refurbishment projects in Sweden?	Building-refurbishment; actor-to-actor tensions; service ecosystem; waste management	NA	38 interviews	data was coded systematically	Future studies should include two other stakeholders, designers as well as waste recycling firms.
Pinna et al. (2020)	Journal of Business Research		What is the impact of organizational and social support on employees' job satisfaction, work engagement, and intention to quit?	Intention to quit; job satisfaction; multi-actor service ecosystem; social and organizational support; value co-creation; work engagement	NA	Questionnaire: seven-point Likert scale	structural equation modeling and analyzing 481 employees' data from an Italian retail chain	Future scholarship should explore and analyze the impact of other mediating attitudinal variables, such as organizational commitment and perceived well-being. Also, investigate gender differences in co-worker support and intention to quit.
Peltier et al. (2020)	Journal of Business Research		How do consumers use different elements along a B2C/C2C Digital Information Flow Continuum to co-create	Digital information flow continuum; service ecosystems; service innovations; service-dominant logic;	NA	a single-factor method in an exploratory factor analysis	structural equation modeling to analyze online survey results	Future research is needed to expand this set and further develop the comparable service quality and access benefits used in this study and see whether different conceptualizations reverse directional

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			value for technological service innovations?	telemedicine; value co-creation			from 827 health consumers	effects.
Vargo et al. (2020)	Journal of Business Research		How can a theoretical framework for conceptualizing diffusion be developed in an extended innovation process, using a service-ecosystems and institutional lens?	Diffusion; ecosystems; innovation; institutions; service-dominant logic	complexity theory	NA	NA	Provide important insights into how value co-creation occurs in, and among, nested and overlapping service ecosystems through innovation diffusion as processes of systemic institutional maintenance, change, and disruption.
McColl-Kennedy et al. (2020)	Journal of Business Research		How do actors resolve tensions through making trade-offs in practice, identifying focal relationships, and the relative influence of focal actors?	choices; customer journey; focal actor; focal relationship; multi-actor; service ecosystem; worldviews	Practice Theory	27 depth interviews	interactive interpretive process	Future research could investigate in-depth the relationship between goal setting, the structure of goals, and choice.
van Tonder et al. (2020)	Journal of Business Research		What are customers' resource integration approaches towards less-skilled customers during socialization and service exchange as informed by their institutional arrangements and institutions endorsing compliant or self-reliant practices?	resource integration; self-services; service ecosystem; socialization; value co-creation	NA	NA	NA	Extend the conceptual framework by examining the underlying reasons why customers have particular socialization institutions.
Vink et al. (2020)	Journal of Service Research		How can a systemic understanding of service design be built to inform	institutional arrangements; service design; service	institutional theory, design	NA	NA	Future research should assess the relevance of existing service design methods to the core processes of service

		actors' efforts aimed at an intentional, long-term change in service systems?	ecosystems perspective; service systems; service-dominant logic	theory		ecosystem design and develop a plurality of new service design methods focused explicitly on encouraging reflexivity and reformation in different contexts.
Chen et al. (2020)	Journal of Business Research	How to investigate conditions for contagion complaints of customers?	complaint contagion; complaint intention; interpersonal influence; multi-actor service ecosystem	social information processing theory	online scenario-based questionnaire	Confirmatory factor analysis (CFA)	Explore strategies to prevent complaint contagions, such as the effects of individual or private interaction between the service provider and complaining customers on complaint contagion.
Giannopoulos et al. (2020)	Journal of Product and Brand Management	It addresses the research questions of how and why in brand development and maintenance overtime in the destination context.	brand co-creation; DMOS; destination branding; qualitative research; service ecosystem; tourism; value co-creation	institutional theory	exploratory research from 18 in-depth interviews with important stakeholders	Content analysis, a coding scheme	Future studies may approach the way new institutions emerge from the changing configurations in resource integration within the service ecosystem.
Tuominen et al. (2020)	Journal of Services Marketing	What does the institutional change mean at the level of value co-creation practices, and what processes underlie these changes?	actors; agency; co-creation; coordination; dialectics; institutional change; routine dynamics; S-D logic; service ecosystem; service processes; value co-creation practices	theory of routine dynamics	develops a conceptual framework	empirical research	How and why institutional change happens in service ecosystems enables and inhibits sustained and beneficial changes in value co-creation routines that produce viable service ecosystems.
Bustinza et al. (2019)	Journal of Business Research	What service capabilities should be retained in-house, and which should be outsourced to specialized partners to maximize organizational and business performance in the case of multinational	ecosystems; knowledge-intensive business service firms; make-or-buy; servitization; product-service systems	NA	the international survey reached 370 service executives	fuzzy set qualitative comparative analysis	Future studies should consider the importance of balancing geographic networks, cultural differences, and customer proximity to accelerate servitization.

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		manufacturing enterprises (MMNEs) operating in different industries?				
Frow et al. (2019)	European Journal of Marketing	How do approaches to adopting "patient-centered care," an important shared worldview within the healthcare sector, affect well-being at the meso level, with implications for all other ecosystem levels?	ecosystem well-being; institutional arrangements; meso level; practices; service ecosystem; shared worldview; well-being	S-D logic, resource integration, resource density, practices, and institutions	meta-theoretical foundations	hermeneutical analysis and transcripts analysis	Need for in-depth analyses that explore other levels of the ecosystem and their interaction. Studying other diverse contexts may provide new insights into how context influences individual practices' importance and benefits. Also, we suggest the need to investigate well-being longitudinally.
Buhalis et al. (2019)	Journal of Service Management	How do technological advancements enable value co-creation among the actors in the tourism services ecosystem?	automation; co-creation; disruption; personalization; sensory experiences; tourism and hospitality	NA	NA	Smart tourism analytics network (STAN)	(1) extra-sensory experiences, reflecting the enhanced sensory experiences possible with virtual and augmented technologies; (2) hyper-personalized experiences, reflecting the merger of location and social context in service experiences; and (3) beyond-automated experiences, reflecting the nature of experiences beyond a process of standardization through automation of services.

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Reviewer: 1

Recommendation: Minor Revision

Dear Reviwer, Thank you very much for your valuable suggestions. They have significantly helped us improve the quality of the paper. We greatly appreciate it.

Comment 1: Thanks for the opportunity to review this paper. The feedback has been worked on and their responses to the comments are clearly addressed. You have done a great job in addressing my previous concerns.
I would like the authors to work on the following;
On page 1 the authors claimed that the paper is between 2004 - 2022. Later, under Study Strategy, Hierarchal Cluster Analysis, and Page 62 of 69 line 46 - 2004 - 2023 were written. Do these authors' reviews cover 2023 when we are in the middle of 2023, I think these should be between 2004 - 2022.
More papers are still coming in 2023.
Response: Thank you so much for your beneficial comment. They have been been changed to 2004-2022.

Comment 2) On Pg 26 of 69 - Service Performance can move to the next page.
Response:Thank you very much for your recommendation it has been corrected.

Comment 3) On pg 30 of 69- Line 2- Scopus or Scupos
Response: Many thanks for your precise attention it has been changed.

Comment 4)Line 18 - What is the full interpretation of EFA, being mentioned for the first time?
Response: We do appreciate your suggestion. The correction has been done as below:
"We suggest that future studies use various bibliometric techniques, like EFA (Exploratory Factor Analysis), to consider another research area".

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Reviewer: 2

Recommendation: Minor Revision

Comments:
Dear Authors,

I read with interest the revised version of your paper and I appreciated the substantial effort you have made in revising the paper. The paper has improved substantially and looks stronger now.

I have three further observations for you at the introduction section of the manuscript, one which is based on the new addition in the revised manuscript, and the other two relates to my previous comments on the paper.
Response: Thank you very much for your valuable suggestions. They have greatly helped us improve the quality of the paper. Your input is much appreciated

Comment 1). New addition: Paragraph 4: In highlighting the gaps in the literature, you suddenly introduce the concept of 'metaverse' without at least explaining what this mean and why it is important in the service ecosystem. Also, in Paragraph 5: You note that "… to present the impacts of the metaverse on this field and the future of the service ecosystem". Again, how and why is this important? A sentence will be sufficient to addressing this.

Response: So many thanks for your offer, it has been done and the related sentence was added as below:
"with the presence of novel engendering of digital technologies such as artificial intelligence, blockchain, cloud computing, big data, edge computing, 5G/6G, VR/AR/MR, and the Internet of Things, a thrilling age of metaverse is approaching which it's features will extremely affect the domain of services (Kozinets, 2022)".

Comment 2). Contribution: It is still not clear to me what your contributions to the literature are. You note that you improve the literature by: "….by offering a quantitative approach to the conceptual structure of the service ecosystem over co-citation analysis using the most cited papers identified, and second, by applying MDS and HCA some driving approaches in service ecosystem research, as well as intellectual structure of this research area have been presented". By doing these two, how did you contribute to the literature – leading to the 'so what' question? Please be more specific by going beyond 'what' you did and also add the 'how' and 'why' these are important. Some additional sentences would be helpful in highlighting your contribution. For example, you could say: first, by offering a quantitative approach to the conceptual structure of the service ecosystem over co-citation analysis using the most cited papers identified, we ……………….. Also, by applying MDS and HCA some driving approaches in service ecosystem research, as well as intellectual structure of this research area, we …………………….

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Response: Thank you very much for your valuable comment, based on your suggestion we have change this part as below:

"first, by offering a quantitative approach to the conceptual structure of the service ecosystem over co-citation analysis, we highlighted the relationships between most highly cited papers and identified knowledge foundations of service ecosystem scope. Also, by applying MDS and HCA, we identified intellectual structure of this research area, as well as some pioneer approaches in service ecosystem domain."

Comment 3). Incomplete sentence: Paragraph 6: Line 52-57: I mentioned in my earlier comments on the paper that this sentence needs to be revised "This study improves the literature in two ways: first, by offering a quantitative approach to the conceptual structure of the service ecosystem over co-citation analysis using the most cited papers identified, and second, by applying MDS and HCA some driving approaches in service ecosystem research, as well as intellectual structure of this research area have been presented." - needs to be revised. However, it is still not clear to me what you are trying to say here. The sentence meaning is not fully captured. Please refer to my suggestion in my previous comment as this may help address this issue.

Response: Thanks a lot for your helpful comment. It has been changed according to your previus comment.