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Research trajectories of Service-Dominant Logic: Emergent themes of a unifying paradigm in business and management

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ABSTRACT

We describe the research trajectories associated with S-D Logic and the scholarly activity it encompasses across a breadth of disciplines by conducting a bibliometric analysis of a body of literature citing two fundamental S-D Logic publications between 2004–2014. The bibliometric analysis reveals four pertinent research trajectories: Value co-creation, Resources (incl. integration), Brands, and Innovation. These empirical findings are supported by qualitative insights and projections obtained from structured interviews with S-D Logic scholars using the Delphi method, which identifies ten research trajectories: Actors, Context, Innovation, Institutions, Markets, Resources, Service, Systems, Value co-creation, and Value propositions. The main tenets, relevant literature, and syntheses of research questions for the aforementioned research trajectories are provided. Results indicate that the scientific community is evaluating fundamental ontological and epistemological questions of S-D Logic. Emergent themes (complex and fractal phenomena, generic conceptualizations, technological innovation and democratization processes, and institutionalization practices) are discussed. The results provide insight into the development of paradigms in the managerial sciences. The delineation of the paradigm's thematic boundaries, its emergent themes, and identification of central research trajectories informs an advanced understanding of the nature of economic exchange and value creation for both practitioners and the managerial sciences, thus aiding the transdisciplinary production of knowledge.

1. Introduction

The "open source" format (Lusch & Vargo, 2006) of the Service-Dominant Logic (S-D Logic) proposed by Vargo and Lusch (2004) has spurred substantial interest within the academic community. The ongoing scholarly debate sparked by the introduction of S-D Logic is an indicator for the paradigmatic properties of S-D Logic (Vargo & Lusch, 2008a). While this expansion is a testament to the integrative qualities of S-D Logic, its interdisciplinary dispersion muddles the paradigm's boundaries — even more so amidst ongoing debates situated across a breadth of disciplines.

Lusch, Vargo, and Tanniru (2009) recognize S-D Logic as a potentially unifying paradigm that enables an informed understanding of the true nature of economic exchange. Our goal is to describe the research trajectories of S-D Logic and the scholarly activity it encompasses. A closer look at research trajectories can aid in the understanding of the unifying paradigm's thematic boundaries, the conceptual cornerstones of scholarly interest and debate, and emergent higher order themes. Taken together, these insights advance understanding of the nature of economic exchange and value creation for the business and management sciences and aid in the transdisciplinary production of knowledge. However, for this developing unifying paradigm's potential to be attained, the interrelations between its key concepts need to be clarified.

Having followed the development of S-D Logic since its introduction, we asked ourselves, what are the research trajectories motivating the development of the paradigm? We sought to find ways of empirical inquiry that highlight these central areas of interest and debate. The resulting analysis and interpretation may provide advanced insights as well as a point of entry for scholars and practitioners alike who are involved in shaping the future of the paradigm.

Over the course of the past decade, the S-D Logic literature has branched into a wide variety of interdisciplinary topics, including those relevant to industrial marketing, such as sales (Haas, Snehota, & Corsaro, 2012), or supply chain management (Tokman & Beitelspacher, 2011). A cursory inspection of this activity can easily bring forth the impression of classic paradigmatic tension (Kuhn, 2012) between two strongly debated competing paradigms –namely Goods-Dominant Logic, which emphasizes tangible output and discrete transactions (Vargo & Lusch, 2004) and Service-Dominant Logic, which emphasizes the integration and application of resources for the benefit of another entity or the entity itself (Vargo & Lusch, 2004). However,

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the incommensurability of competing paradigms that usually triggers a scientific revolution presents a wicked problem (Buchanan, 1992), that does not have a single solution for an integrative discipline such as the business and management sciences; possibly even an unsolvable problem in the social sciences (Dogan, 2001). Evidently, S-D Logic was proposed as a logic, a worldview or theoretical lens so to speak, rather than claiming to be a testable theory. Moreover, the transcending conceptual nature of S-D Logic, fosters general disciplinary integration. Consequently, the consensus that would mark the acceptance of a paradigm is likely to remain scattered across disciplines, thus seemingly inchoate.

The key to understanding the paradigmatic influence of S-D Logic lies in exploring its impact on the business and management sciences by evaluating its capacity to stimulate the myriad ongoing debates, re-evaluations, and improvements true to its "open source" goal. Involved in this process of paradigm negotiation are scholarly resources. These scholarly resources broadly encompass all the entities involved in the production of knowledge, which are generally embodied by academic publications, but they also include the ephemeral aspects of this process, such as idea generation, experimentation, discussions, contributions, and citations.

This awareness suggests that a retrospective analysis of the aforementioned process of knowledge production would principally serve the purpose of documenting past developments with only a limited capacity to predict future developments or to examine such predictions. Thus, we present a combined retrospective and prospective approach to reveal the pertinent research trajectories of the S-D Logic paradigm. We accomplish this goal by analyzing retrospectively the bibliometric structure of the academic debate spurred by S-D Logic. We enrich these empirical findings by combining them with the insights and projections obtained from structured interviews with S-D Logic experts (Delphi method, Dalkey & Helmer, 1963). Finally, we synthesize common higher order themes that emerge from the content of the scholarly activity under analysis. The methodological approach laid out here therefore lends itself to studying paradigms in any type of integrative discipline in the social sciences.

This article is structured as follows: First, we review the literature on research trajectories. Second, we present the bibliometric methodology and results. Third, we describe the Delphi method, summarize the extracted research trajectories and organize the gathered research questions by philosophical categories. Fourth, we reflect these findings against the bibliometric data, discuss how they relate to S-D Logic, and propose emergent higher order themes for the business and management sciences that are characteristic of a unifying paradigm.

2. Research trajectories

The objective of this article is to identify research trajectories pertinent to the S-D Logic paradigm. As paradigms develop through cumulative knowledge growth, their developmental stage may be determined by the scientific community's degree of consensus regarding the paradigm's theoretical structures and the methodological approaches employed to explore them (Kuhn, 2012). Mapping research trajectories can provide higher-level insights into the development of paradigms in the business and management sciences and, more specifically, refine some of the fuzzy boundaries surrounding themes central to the study and development of a unifying paradigm. Generally, advancements in research fields occur along specific research trajectories wherein key concepts are refined and extended in scope. Such advancements are rarely triggered by sudden and radical change; thus identifying research trajectories may point to fruitful areas for future research. Specifically, as knowledge accumulates over a period of time, a framework becomes necessary to organize the generated facts and ideas (Mackenzie & House, 1978). We argue that such an organizing framework may be constructed by analyzing research trajectories, since their identification nurtures the growth of scientific fields (Schildt, Zahra, & Sillanpää, 2006).

Retrospective research trajectories have previously been studied by applying bibliometric means. For instance, Vogel and Güttel (2013) used co-citation analysis to study the development of the strategic management literature. Callon, Courtial, and Laville (1991) employed co-word analysis to analyze research trajectories in the polymer sciences. Although adopting a dynamic approach, namely comparing dominant themes across time periods (Vogel & Güttel, 2013), allows for the identification of past research trajectories, its capacity to extrapolate and identify future themes is limited, therefore applied prospective research methods to identify research trajectories are needed. We first present the results of our bibliometric analysis and follow up by discussing the findings of our futures research (Delphi study).

3. Bibliometric analysis: knowledge discovery through co-word analysis

3.1. Bibliometric research process

We employ a co-word analysis to identify the research trajectories of S-D Logic. The idea of knowledge discovery through co-word analysis was initially proposed by Callon, Courtial, Turner, and Bauin (1983) as a bibliometric analysis technique to map out associations between words in textual data. Co-word analysis does not rely on an a priori definition of themes, but instead empirically detects and extracts themes via the co-occurrence of words (Callon, Law, & Rip, 1986; Callon et al., 1991; He, 1999). The focus of this method of inquiry is not on the content of the individual scholarly resources, such as published articles, but rather their citation structures and shared themes. More specifically, the meta-data and citation trees contained within indices such as Thomson Reuter's Web of Science serve to map the structure of academic knowledge.

We divided the workflow of co-word analysis into five basic steps: (1) collection of raw data, (2) extraction of relevant information from the raw data, (3) network generation and calculation of similarities between items based on the extracted information, (4) use of a clustering algorithm to detect the themes, and (5) use of a similarity measure to detect connections between clusters across specified sub-periods (Cobo, López-Herrera, Herrera-Viedma, & Herrera, 2011).

The software SciMAT (Science Mapping Analysis Tool) ver. 1.1 (Cobo, López-Herrera, Herrera-Viedma, & Herrera, 2012) was used to generate a full network map of keywords and their co-occurrences over the entire publication period under study (2004–2014). The entire period is divided into sub-periods and an independent network is generated for each sub-period. Following the logic that the more keywords a set of documents has in common the more similar the documents are. Themes are thus indicated through affiliation. From the citation data, SciMAT internally generates a complete network, in which a node represents a keyword and the edges between these nodes represent the co-occurrence of keywords in all documents in the sub-period corpus. However, it would be difficult to visually render and interpret such a large network; hence the use of an algorithm to reduce the network by extracting clusters of prevalent keywords. These clusters reveal the thematic areas in which scholarly activity was present (i.e. the conceptual subdomains of a research field). Cobo et al. (2011) define a thematic area as "a group of evolved themes across different subperiods." In the following, we refer to research trajectories as the themes that are linked across time sub-periods due to their similarity.

However, while pointing to areas of scholarly activity and interest, the bibliometric approach only allows limited insight with regards to the nature of the debate and will need to be supplemented with qualitative methods of inquiry. For each sub-period, the relative position of thematic clusters within the overall network — and consequently among each other — can be plotted in a strategic diagram using established network measures such as Callon's density and centrality (Callon et al., 1991). The density measure denotes the internal strength of a network cluster whereas the centrality measure indicates the

relative strength of its external ties. In other words, it reveals shared keywords with external clusters, and more generally, the connection of a theme with other themes in the overall network. These measures in combination are useful to gauge the relative developments among different fields (density) and their connection with other areas (centrality). S-D Logic's integrative capacity allows for the study of relevant phenomena across disciplines by enabling a shared perspective; hence, the centrality measure is of primary interest to inform our inquiry as it indicates thematic connections throughout the overall research field.

In order to trace the evolution of a thematic area (Garfield, 1994) across several sub-periods, the overlap between two thematic clusters in adjacent sub-periods is indicated by a similarity measure. This procedure follows the logic that if clusters share the same keywords across sub-periods, they must belong to the same research trajectory as it continues through time.

3.1.1. Data source

From the outset, we were mindful of the possibility of introducing bias into the analysis, which could occur by choice of citation data source and the keyword-grouping procedure to be performed thereafter. Our first decision concerned the data source: Thomson Reuter's Web of Science (WoS), Reed Elsevier's Scopus, and Google's Google Scholar are the most often used tools in citation research (Ale Ebrahim et al., 2013). In 2014, WoS Core Collection listed nearly 1200 documents citing Vargo and Lusch (2004), and Google Scholar found more than 6000 citations. While Google's less restrictive index may provide a rich snapshot of the dispersion of S-D Logic within a broader literature, its major shortcoming — for the purpose of co-word analysis — is the absence of author keywords in the citation database. While feasible, manual keyword tagging would certainly introduce subjective bias and is therefore generally not performed in bibliometric inquiries. WoS and Scopus exhibit almost perfect correlation (Archambault, Campbell, Gingras, & Larivière, 2009) and eventually, Thomson Reuter's consistent academic citation index was chosen.

Due to the intentionally S-D Logic-specific sample of citation data, a performance analysis cannot be conducted reliably as part of the science mapping analysis effort. Such an undertaking would require a more inclusive dataset, such as the entire 11-year citation record of all academic journals in which an S-D Logic publication was ever cited. Given the dispersion of S-D Logic into academic fields beyond that of marketing, such an endeavor would inflate the corpus of citation data exponentially and produce more noise than interpretable results. Our decision to generate a citation tree originating from two foundational S-D Logic publications (Vargo & Lusch, 2004, 2008a) was based on this study's objective to hone in on the research trajectories of S-D Logic. Initial surveys of the literature showed that publications concerned with contributing to the development of S-D Logic cited either publication or both (Ehrenthal, 2012; Kryvinska, Olexova, Dohmen, & Strauss, 2013). Consonant with common practice (Cobo et al., 2011) we divided the 11 years of citation data into two 4-year sub-periods (2004–2007, 2008–2011) with a shorter final 3-year sub-period (2012–2014) in order to detail recent developments.

By exporting citation data originating with the two main S-D Logic publications, the resulting cross-sectional sample includes publications from a variety of disciplines. As a consequence, common bibliometric performance indices such as the *h*-index are not included in the analysis as they take into account the citation distribution of other publications and serve only as a reliable comparative measure when applied within the same field. In the present analysis, the total number of documents associated with a keyword serves as a simple comparative measure between themes.

3.1.2. Citation data extraction

The present study is limited to a co-word analysis based on academic publications directly citing either Vargo and Lusch (2004) or Vargo and Lusch (2008a), henceforth abbreviated as VL2004 and VL2008. On October 8, 2014 Thomson-Reuters WoS core collection listed 1116 publications for VL2004. For VL2008, there were 347 publications available in the WoS core collection. Full records were exported from WoS and a total of 1220 documents were imported into SciMAT 1.1 after deduplication.

The refined dataset used for the analysis included the citation record of 1220 unique publications spanning a time period from January 2004 until September 2014. These documents were obtained from 217 published journals, with 2271 contributing authors, containing a total of 4349 author-assigned keywords and Thomson Reuters KeyWords Plus ™ before consolidation. The periods of analysis have been fixed to three sub-periods: from the beginning of 2004 to the end of 2007 (T1), from 2008 to 2011 (T2), and from 2012 to 2014 (T3). The longer first four-year interval provides sufficient input to saturate the model for the initial co-word analysis as well as to allow for analyzing the development of the research field containing two sub-periods with the inclusion of VL2008-citing documents. Table 1 shows a list of source journals, which is limited to those with a minimum of ten documents per publication for visual simplicity. It is noteworthy that *Industrial Marketing Management* contains by far the most articles citing VL2004 or VL2008. The list of authors who contributed publications to the overall dataset is displayed in Table 2, limited to a floor of five publications for visual simplicity. While the cut-off point is for presentation purposes only, naturally all of the available publications were included in the analysis.

3.1.3. Keyword assignment

In order to answer research questions pertaining to the origin, emergence, and relationships of thematic clusters, an unbiased approach in terms of keyword analysis was required. We thus decided to exclude WoS KeyWords Plus™ from the analysis. These keywords are automatically generated and assigned to published documents in addition to the organic keywords provided by authors.

Since the co-occurrence of keywords provides the foundation for the present analysis, much care went into combining them into meaningful keyword groups. When performing the co-word analysis, SciMAT treats a keyword group as a single semantic unit. The distinct keywords 'Value co-creation', 'Co-creation of Value', and 'Value-cocreation' all refer to the

Table 1
Citation data source journals with number of documents per publication citing VL2004 or VL2008. Cut-off at 10 documents per publication for presentation purposes only.

Journal	Documents per publication
Industrial Marketing Management	110
Journal of Service Management	60
Journal of Service Research	50
European Journal of Marketing	49
Journal of Business Research	48
Marketing Theory	47
Journal of the Academy of Marketing Science	46
Journal of Business and Industrial Marketing	40
Managing Service Quality	34
Journal of Services Marketing	31
Journal of Marketing	29
Service Industries Journal	29
Journal of Macromarketing	22
European Management Journal	17
Tourism Management	15
Journal of Product Innovation Management	14
Production Planning & Control	12
Management Decision	12
International Journal of Operations & Production Management	12
International Journal of Hospitality Management	11
Journal of Public Policy & Marketing	11
Journal of Business-to-Business Marketing	11
International Journal of Service Industry Management	11
Information Systems and E-Business Management	10

Table 2
Contributing authors in citation data (January 2004 – September 2014) associated with documents citing either VL2004 or VL2008. Cut-off at 5 documents per author for presentation purposes only.

Author last name	Author first name	VL2004/2008 citations	Region	Institution	Location
Edvardsson	Bo	22	Nordic	Karlstad University	Sweden
Vargo	Stephen	21	USA	University of Hawai'i	US-HI
Lusch	Robert	20	USA	University of Arizona	US-AZ
Brodie	Roderick	10	Pacific	University of Auckland	New Zealand
Gebauer	Heiko	10	Europe	Eawag	Switzerland
Grönroos	Christian	10	Nordic	Hanken School of Economics	Finland
Storbacka	Kaj	10	Pacific	University of Auckland	New Zealand
Möller	Kristian	9	Nordic	Aalto University	Finland
Witell	Lars	9	Nordic	Linköping University	Sweden
Gummesson	Evert	8	Nordic	Stockholm Business School	Sweden
Gustafsson	Anders	8	Nordic	Karlstad University	Sweden
Maglio	Paul	8	USA	University of California Merced	US-CA
Brown	Stephen	7	Europe	Ulster University	Ireland
Cova	Bernard	7	Europe	KEDGE Business School Marseille	France
Frow	Pennie	7	Pacific	University of Sydney	Australia
O'Cass	Aron	7	Pacific	Tasmanian School of Business & Economics	Australia
Ballantyne	David	6	Pacific	University of Otago	New Zealand
Bitner	Mary Jo	6	USA	Arizona State University	US-AZ
Blocker	Christopher	6	USA	Baylor University	US-TX
Demirkan	Haluk	6	USA	University of Washington Tacoma	US-WA
Enquist	Bo	6	Nordic	Karlstad University	Sweden
Evans	Kenneth	6	USA	Lamar University	US-TX
Fisk	Raymond	6	USA	Texas State University	US-TX
Maull	Roger	6	Europe	University of Surrey	UK
Nenonen	Suvi	6	Pacific	University of Auckland	New Zealand
Ng	Irene	6	Europe	University of Warwick	UK
Ordanini	Andrea	6	Europe	Bocconi University	Italy
Parasuraman	A	6	USA	University of Miami	US-FL
Richey	Glenn	6	USA	Culverhouse College of Commerce	US-AL
Snehota	Ivan	6	Europe	Università della Svizzera italiana	Switzerland
Spohrer	Jim	6	USA	IBM	US-CA
Tokman	Mert	6	USA	James Madison University	US-VA
Yuan	Soe-Tsyr	6	Asia	National Chengchi University	China
Corsaro	Daniela	5	Europe	Università Cattolica del Sacro Cuore	Italy
Gremler	Dwayne	5	USA	Bowling Green State University	US-OH
Heinonen	Kristina	5	Nordic	Hanken School of Economics	Finland
Holmqvist	Jonas	5	Nordic	Hanken School of Economics	Finland
Jaakkola	Elina	5	Nordic	University of Turku	Finland
Kowalkowski	Christian	5	Nordic	Hanken School of Economics	Finland
Kristensson	Per	5	Nordic	Karlstad University	Sweden
Patricio	Lia	5	Europe	Universidade do Porto	Portugal
Payne	Adrian	5	Pacific	University of New South Wales	Australia
Polese	Francesco	5	Europe	Università degli Studi di Salerno	Italy
Rust	Roland	5	USA	University of Maryland	US-MD
Salle	Robert	5	Europe	EMLYON Business School	France
Saren	Michael	5	Europe	University of Leicester	UK
Sharma	Arun	5	USA	University of Miami	US-FL
Sheth	Jagdish	5	USA	Emory University	US-GA
Skålén	Per	5	Nordic	Karlstad University	Sweden
Tronvoll	Bård	5	Nordic	Karlstad University	Sweden
Warnaby	Gary	5	Europe	University of Manchester	UK

same concept, but would be treated as different units if not grouped into a single, semantically cohesive keyword unit. By combining the distinct keywords into a single conceptual node and labeling it with a single unambiguous keyword ('Value Co-creation'), the subsequent analysis more likely identifies conceptual linkages rather than dispersed and arbitrary co-occurrences. In order to eliminate further redundancies, an automatic scan for plural words was performed: The keywords "organization" and "organizations" for example were combined into a single keyword group and labeled "organizations." However, this automatic grouping was reversed for the keywords "service" and "services" since the distinction between the singular and plural word carries meaning in the context of S-D Logic (Vargo & Lusch, 2008b). Other spelling discrepancies such as British vs. American English (behaviour vs. behavior), and acronyms (B2B, Business-to-Business, etc.) were smoothed away as much as possible. This process was performed for all keywords that were associated with a minimum of six documents. In the subsequent analysis, a network reduction algorithm was used in order to maintain the interpretability of the results so that, more peripheral and less-frequent keywords would not surface in the results. The keyword group containing instances of the keyword for S-D Logic ('SDL', 'SD-logic', 'Service Dominant Logic', etc.) was excluded from the analysis due to the intentional S-D Logic specificity of our sample. A total of 470 keyword groups were eventually included in the analysis and served as the basis for the co-word analysis. Table 3 shows the number of available documents per sub-period with associated keyword statistics.

Table 3
Number of documents in citation data per analyzed sub-period with associated total keyword groups and average keyword groups per document. SD = Standard deviation.

Sub-period	Documents	Keyword groups	Average keyword groups per document	SD
2004–2007	99	208	5.47	(3.73)
2008–2011	537	402	6.61	(3.32)
2012–2014	584	416	7.30	(3.12)

3.1.4. Network mapping algorithm

The present analysis was performed using SciMAT version 1.1 configured with the following parameters: Author words as unit of analysis (no KeyWords Plus™, or manually added keywords), co-occurrence network, inclusion index normalization measure, simple centers clustering algorithm (maximum cluster size 5, minimum cluster size 3), and inclusion index evolution measure. More information regarding the SciMAT parameters and its network generation and reduction settings can be found in Cobo et al. (2012).

3.2. Bibliometric study results: research trajectories of S-D Logic

In order to interpret the results of the co-word analysis, this section is divided into three parts: In the first part we look at the similarities between keyword groups across periods. In the second part, we discuss the evolutionary timeline of thematic clusters and their sub-networks. We identify four pervading research trajectories within S-D Logic to date. The third part takes a closer look at the relationship of these research trajectories among each other in terms of their respective development, importance, and contribution.

3.2.1. Stability

As shown in Fig. 1, the number of total keywords increments from the first sub-period (71 keywords) to second sub-period (247 keywords), indicating the introduction of documents citing VL2008 and the growing interest of the academic community in S-D Logic. In the third sub-period, the total amount of keywords (262 keywords) remains relatively stable. Generally, a high number of incoming keywords (T2:191, T3:72) compared to outgoing keywords (T1:14, T2:57) per sub-period indicates that the interest in the development of the S-D Logic field remains high. The high similarity index (0.77–0.80) for keywords transferred between sub-periods (horizontal arrows) suggests that a consolidation of S-D Logic's terminology is taking place. However, these statistics reveal only little about S-D Logic's marginal contribution to the various latent themes contained in the structural relationships between these keywords. Hence, further analysis of their structure and qualitative inquiry is required.

3.2.2. Evolution

Using appropriate network reduction algorithms, a condensed version of the evolutionary timeline generated by SciMAT is displayed in Fig. 2. Considering that Fig. 2 is generated from an S-D Logic specific citation sample, it can be interpreted as a map indicating areas of inquiry that experienced scientific activity related to S-D Logic, where existing topics are re-evaluated or new ones are debated. Bearing in mind the level of network reduction, the displayed themes were attracting relatively high levels of academic activity.

To maintain interpretability of the overall results, we focus the analysis on the thematic areas that exhibited high association strength across sub-periods; meaning that they share the same name or that at least one keyword is an element of another cluster. The links between the identified themes across sub-periods give rise to what Cobo et al. (2011) defines as thematic areas and that we label trajectory to emphasize their directional nature, progress, intersections and overlaps with other themes.

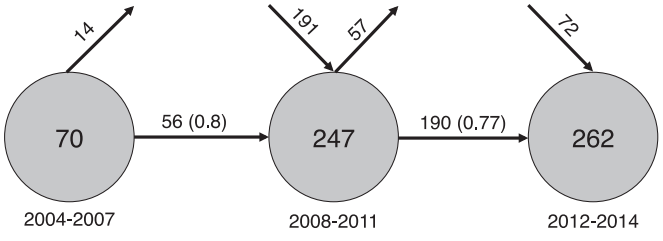

Fig. 1. Incoming and outgoing keywords between successive sub-periods. Similarity index in parentheses.

We extracted four pervasive research trajectories and labeled them according to their most central keyword in the last sub-period: 1) Value Co-creation, 2) Resources incl. Resource Integration 3) Brands, and 4) Innovation. Scholarly activity related to S-D Logic has been concentrated along these research trajectories over the last decade.

As expected, all keywords in the network pertain to areas of general economic organization and management. The keyword constellations portrayed in Fig. 2 articulate how the themes that they designate are organized and connected among each other – seen from an S-D Logic centric point of view. Obviously, not every publication that contributed keywords to this network has an S-D Logic focus. It is the resulting thematic constellations taken together that hint at the paradigmatic influences of S-D Logic in the general area of economic organizing and management. For example, the thematic area *Value Co-creation* is fundamental to S-D Logic and attracts various keywords over the first two sub-periods. In the last sub-period the association with keywords such as “Practices”, “Technology”, and “Systems” suggests a thematic influx from the areas of Sociology and Systems theory. Similarly, the thematic area labeled *Innovation* attracts the keywords “Open-Innovation” and “Consumers” in the last sub-period, suggesting the appreciation of innovation is a process that does not emanate from “Organizations” alone, but involves various actors from the ecosystem. These assumptions may appear crude compared to the in-depth apprehension of a topic that can be expressed in a single research article. However, the strength of this initial bibliometric exposé lies in revealing common threads and themes.

The four research trajectories are horizontally shaded in Fig. 2 with their thematic nexus –the node by which themes are connected across sub-periods- centrally labeled in each sub-period. Connections between sub-networks are indicated by dotted lines as exemplified by the shared keyword “service” between the *Value Co-creation* and *Resources* areas between the first two sub-periods.

Observing the development of the S-D Logic research field according to the grouping of thematic areas leads to the conclusion that the four main themes developed on relatively isolated trajectories. Most themes originate from a theme identified in a previous sub-period, indicating the stable and cohesive development of that theme. With the exception of *Resources*, which shares its origins with *Value Co-creation* in the first sub-period, the continuous and compact development of all themes indicates interest from the academic community across all sub-periods.

3.2.3. Comparative network measures

In order to gauge their comparative development over time we plotted each of the last two sub-periods' themes in a strategic diagram according to their centrality and density rank values. The centrality measure indicates the theme's strength of external ties to other themes, and can thus be understood as an indicator of importance and/or contribution in the development of S-D Logic. The density measure denotes the strength of internal ties among the keywords within a cluster that describe the theme; it can be understood as a measure of the theme's own development. These network measures taken together can be interpreted as a marker for the locus of academic inquiry. A theme that stimulates isolated internal development such as the theme *Brands* in the last sub-period for example would suggest that the academic community's effort remained relatively confined to a specific thematic area. Under no circumstance does this mean it is an unimportant or underdeveloped area in general, it simply is a statement about the theme's relative position to other themes that are referencing S-D Logic within a given time period. A research trajectory such as *Resources* that developed increasingly strong internal and external ties to other themes within the S-D Logic paradigm would suggest that the academic community was attentive to both developing the theme internally, but also strengthening conceptual ties to other related research trajectories.

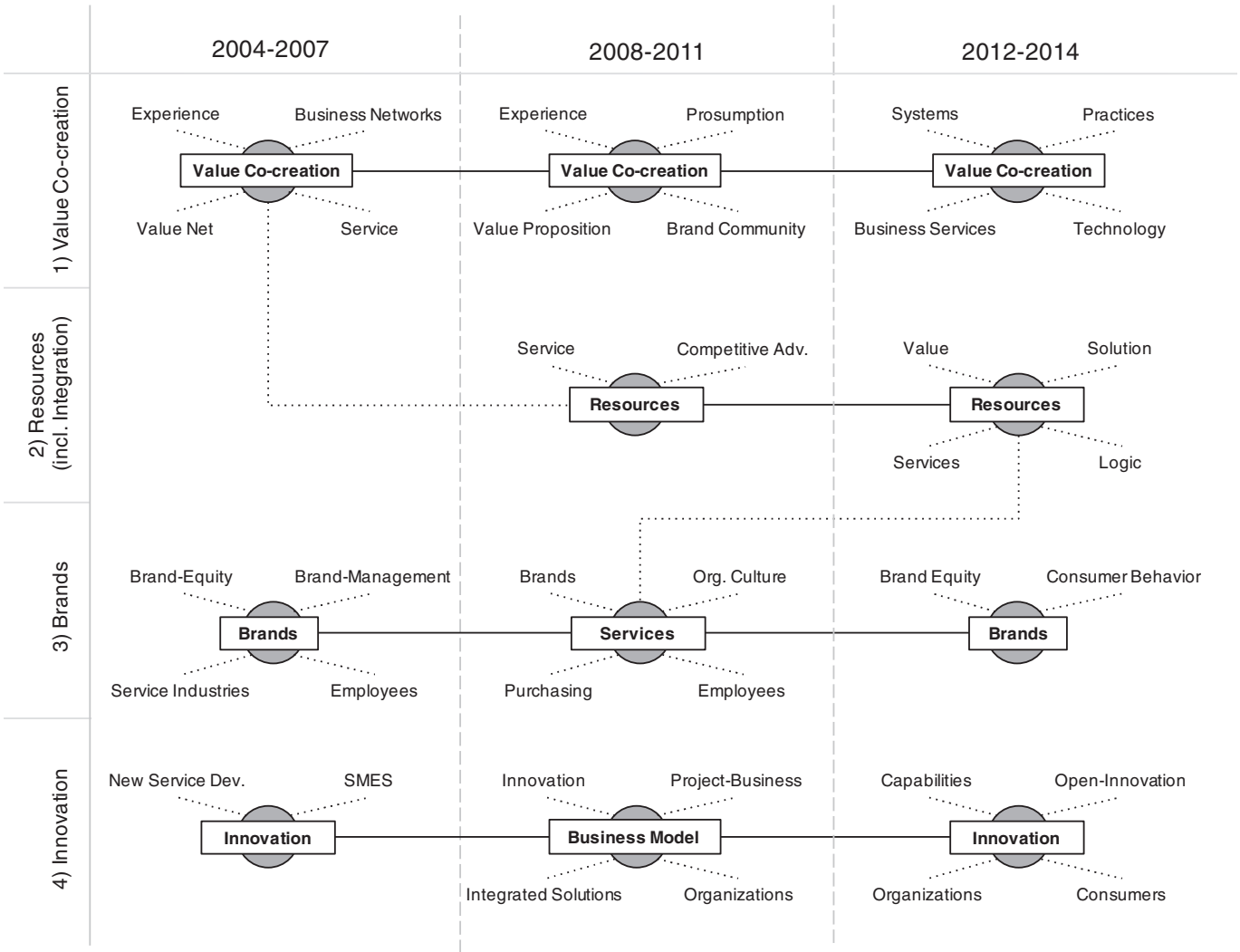

Fig. 2. Evolutionary map of 4 pervasive research trajectories (horizontal) across 3 sub-periods (vertical). The label of the thematic nexus is indicated centrally placed inside the bounding box. Horizontal solid line connections across sub-periods constitute connections between research trajectories across the three sub-periods. Sub-network connections among keywords and across research trajectories are indicated by a dotted line.

The respective median values of the derived network measures for each research trajectory's sub-period themes were used to categorize them into four groups: 1) Motor themes -both high in centrality and density- important to structuring an entire research field since they are externally related to conceptually related themes. 2) Basic and transversal themes -high in centrality, but low in density- important to the field, but not well-developed yet. 3) Developing but isolated – low centrality, but high density- specialized and well-developed areas, but of marginal importance to the entire field. 4) Peripheral –both low in centrality and density- newly emerging or disappearing themes fall into this quadrant.

Fig. 3 shows that the research trajectory *Value Co-creation* ranks highly both in terms of centrality and density, confirming that it is an important and well-developed motor theme of the S-D Logic field. Compared to the second sub-period, *Value Co-creation* has gained momentum in the last sub-period and the current trajectory suggests that this theme will remain a central aspect of the S-D Logic field, albeit the slight decrease of documents associated with the cluster. The *Resources* (including resource integration) theme has gained both in centrality and density from the second to the third sub-period, moving from the peripheral quadrant to the motor theme quadrant, indicating how this trajectory has become more strongly linked to other themes within the S-D Logic field. The *Brands* trajectory has decreased slightly, both in terms of centrality and density, moving it from the edge of the motor theme quadrant towards the upper left quadrant with developed, but isolated themes. This development indicates that the *Brands* trajectory is internally well developed, but shows signs of having become less relevant to the S-D Logic paradigm. The *Innovation* trajectory has remained stable in the motor theme quadrant across the two last sub-periods under study.

The purpose of the bibliometric analysis was to gain an understanding of the structure and evolution of the research trajectories that were influenced by the academic debate prompted by S-D Logic's introduction. Four research trajectories were identified, and as far as methodologically supportable, statements about their relationships were formulated based on empirical data. The concepts of centrality and density were introduced to gauge the relative performances of these thematic areas, viewed strictly from an S-D Logic centric perspective.

4. Delphi method: research trajectories of S-D Logic

4.1. Delphi research process

With our overall objective to reveal the research trajectories of the S-D Logic paradigm, the initial findings need further support. The preparatory examination of the bibliometric data and the systematic literature

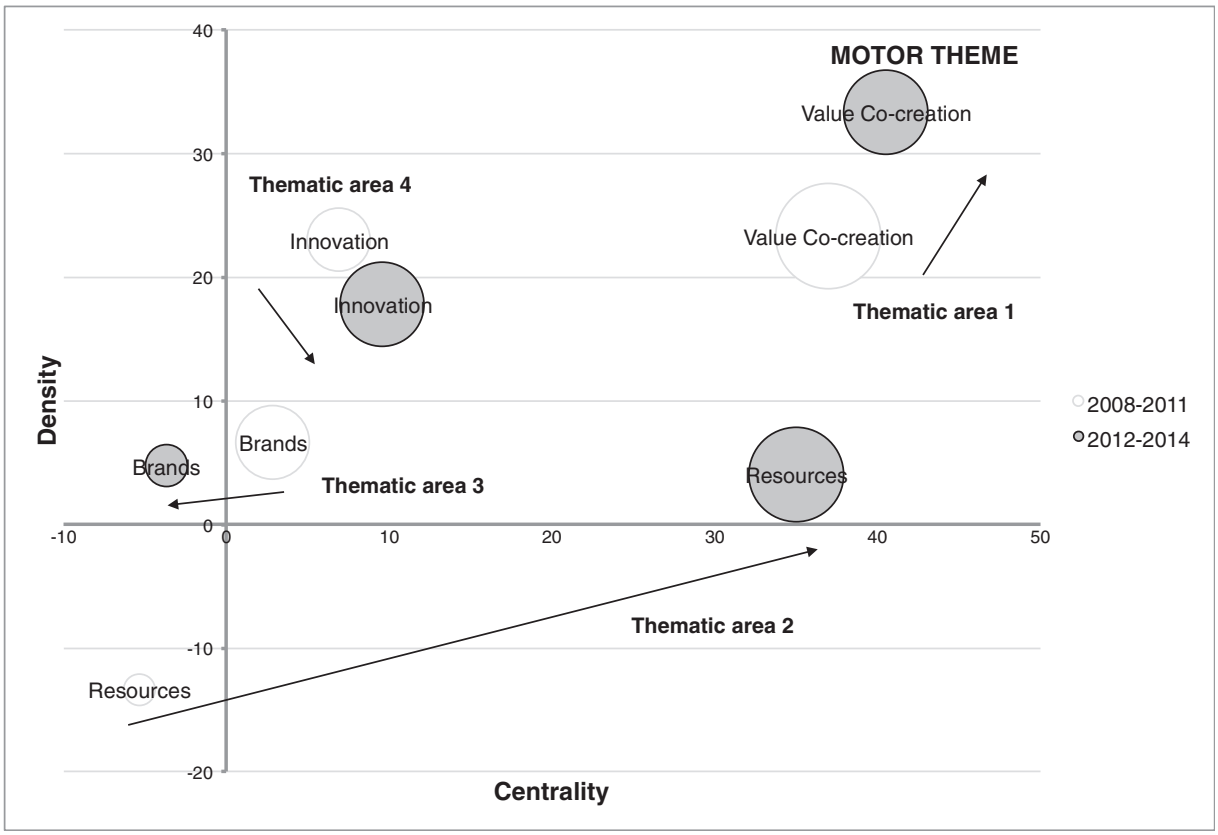

Fig. 3. Strategic diagrams of 4 thematic areas for last two consecutive sub-periods. Note: Centrality and density scores are normalized between sub-periods to reflect relational positions across sub-periods.

reviews by Ehrenthal (2012) and Kryvinska et al. (2013)confirm the ingress of S-D Logic into scattered research domains and its interdisciplinary dispersion. A quantitative bibliometric analysis can detect research trajectories, but it is necessary to complement these findings qualitatively in order to gain an organic understanding of the scholarly activity bound to influence the S-D Logic paradigm in the future.

We opted to inform our empirical findings with a Delphi study (Dalkey & Helmer, 1963). Structured interviews were conducted with a panel of S-D Logic scholars, providing a comprehensive account of the research trajectories, conceptual cornerstones and emergent themes that are likely to influence the S-D Logic paradigm in the coming 5–10 years. We expect that the research trajectories revealed by the bibliometric study will be concordant with those identified by the expert panel in the Delphi study.

The Delphi method presents several advantages in comparison to group interviews or workshops: Instead of highlighting individual perspectives, it fosters community consensus. It enables experts to anonymously suggest and provide mediated feedback to each other's responses. Exposure to open confrontation, group-think, self-censoring, or other similarly detrimental aspects of social interaction during a discussion is limited. In essence, the Delphi method enables experts to freely speculate in terms of the future of S-D Logic, creatively adding ideas, as well as challenge the current paradigm.

A Delphi study typically involves four phases: 1) problem definition, 2) panel selection, 3) determining panel size, and 4) conducting the Delphi rounds (Loo, 2002). In the following, we provide details about these phases. Considering the duration of academic publishing cycles, setting the target foresight period to 5–10 years provides useful results for members of the academic community designing their research programs today, yet also extends far enough into the future so that experts could conjecture entirely novel developments. We extracted 52 authors (Table 2) from the corpus of the bibliometric data, considering those as experts who had published at least five articles citing either VL2004 or VL2008. After gathering affiliations and contact details online, we inspected the list to ensure sufficient geographic dispersion of scholars in order to prevent bias and over-representation of a particular school of thought. With an expected response rate of 20–30%, the initial list of 52 experts would leave the recommended number of 10–15 experts to interact with (Okoli & Pawlowski, 2004).

4.1.1. Round 1: invitation and theme origination

The panelists were contacted by email, asking them to join a group of S-D Logic experts and to provide consent for their participation after being informed of the goal of the study. We received positive responses from 20 experts, of which 14 participated throughout the entire process. The structured interviews were conducted in four rounds. In Round 1, we asked the experts two questions regarding the future of S-D Logic: 1) "What are the most important theoretical concepts or themes that will be guiding the development of S-D Logic in the next 5–10 years?" and 2) "Who do you think will be the most cited scholars in S-D Logic in the next 5–10 years? (these can be scholars internal as well as external to the field)".

The second question was left unanswered by the majority of panelists and we do not discuss it further. Following Zettinig and Vincze (2011), we prompted the experts to provide at least 6 points per question with brief explanations of their answers in order to rule out potential ambiguities when synthesizing the accumulated answers at a later stage.

4.1.2. Round 2: synthesis of originated themes and confirmation

The Delphi method enables iterative validation of the researcher's interpretation and categorization of the results (Okoli & Pawlowski, 2004). In Round 2, we provided the experts with the results of the first round. We categorized the responses into a list of 24 theoretical

themes. In addition, we supplied the experts with ideas that had been raised during Round 1. Sharing feedback from the group to the individual participants allows them to reevaluate their answers in light of new contributions from the panel. Participants confirmed that their viewpoint had been taken into account and were given opportunity to supply additional comments. In the Delphi methodology the facilitator's role is to synthesize results during ongoing rounds of interaction. Thus, themes were thematically aggregated such that co-creation of service subsumed co-production, co-distribution and co-pricing for example. For the sake of clarity we aimed at keeping the number of concepts manageable in order to facilitate forthcoming rounds of interaction. After two rounds of interaction, we consolidated the responses into a final list of 20 concepts (Table 4) that synthesized all topics mentioned by the expert panel. No objections were raised with regards to the consolidated list after Round 2, allowing us to proceed with the next round.

4.1.3. Round 3: conjecturing the performance of future research trajectories

After obtaining a robust list of 20 concepts, we intended to link them along the dimensions of centrality and density to the findings derived from the bibliometric study. In order to gauge the trajectory's expected future performance, we devised a survey instrument that prompted panelists to classify each of the 20 concepts along two dimensions guided by two questions: 1) "How much attention the concept/theme is going to receive from the academic community in the next 5–10 years?" and 2) "How essential the concept/theme is going to be in the future of S-D Logic in the next 5–10 years?" These two questions aim at establishing the link between the bibliometric results by translating the concept of density and centrality to be applicable to the forward-looking Delphi study. In addition, content validity issues were addressed by ranking themes in terms of how essential they were in the eyes of the expert panel. The core intention was to identify research trajectories that experts consider to become central to the S-D Logic paradigm in the future. The online survey platform Qualtrics displayed each of the 20 concept labels next to a coordinate grid in random order. Participants used the grid to classify each concept along the two dimensions of centrality and density, recorded on a scale from −250 to 250. The grid was divided into four quadrants: a) Motor theme, b) Basic and transversal, c) Developed but isolated, and d) Peripheral. Descriptions for these quadrants were also provided to participants; displayed alongside the coordinate grid (both displayed in Fig. 4). Participants used a crosshair to classify each theme along the two axes.

Using the averaged scores from all experts, the 20 concepts shown in Fig. 5 are classified into the four quadrants, each represented by a circle. The diameter of the circle indicates an agreement score calculated from the standard deviations of the density and centrality measure. Thus, a larger circle denotes stronger expert agreement regarding the development and importance per concept. Analogous to the bibliometric study, the median values for the 20 averaged density and centrality scores were used to center the coordinate grid. A table of the scores is provided in Appendix A.

With the concept classification task we measured the perceived importance of the suggested concepts and themes to S-D Logic for the next 5–10 years. In other words, we intended to gauge community consensus with regards to the importance of these research trajectories; those that will both receive attention from the academic community and may be essential to S-D Logic in the future. Analogous to the discussion of comparative network measures in the bibliometric study section we direct our attention to the two quadrants with high centrality values: motor themes and basic and transversal themes. For comparative purposes we provide a composite agreement score derived from the standard deviations of centrality and density scores (Fig. 5, Appendix A). We truncated one half of the 20 themes that were rated lower than the centered scale mean (0) on the centrality dimension and are thus viewed as less essential research trajectories according to the S-D Logic experts' classifications. This median split was performed in the interest of conciseness, but we would like to emphasize that the mere expert mention of a particular theme suggests it is germane to S-D Logic. For instance, several themes close to the scale mean exhibit low agreement scores (e.g. networks and cocreation of service), meaning that some experts may consider them more important to S-D Logic regardless of the centrality median criterion we employed. By contrast, generalizable statements regarding motor themes with high agreement scores (e.g. systems, value proposition) are less precarious.

4.1.4. Concluding the Delphi process: driving questions

In the final Round 4, we honed in on the 10 research trajectories that were considered as being most central to S-D Logic. Expert panelists were asked to formulate the research questions they believe will be driving S-D Logic development per each of the 10 central concepts. We received 73 potential research questions that varied in scope and aim. To facilitate analysis and present results in a concise and meaningful way, we opted ex post to organize questions into a suitable framework based on the philosophy of science. After eliminating redundancies the remaining 48 aggregated questions pertained to the ontology and epistemology of S-D Logic's key concepts, or could be ascribed a relationalist, pluralist, holistic, emergentist, and reductionist goal. The selection of philosophical categories and the subsequent classification of questions was conducted consonantly by the authors for the purpose of examining the research trajectories of S-D Logic on a higher level of abstraction. The authors acknowledge that the chosen categories are not mutually exclusive and that the questions merely attest to a collective interest and should be taken as an indicator of potential for future scholarly debate. Such structured presentation in Appendix B may also support scholarly discussion with regards to the emergence of higher order themes of a unifying paradigm and its theoretical development in business and management (Vargo & Lusch, 2016b). The research trajectories that arose from the Delphi research process are discussed individually in the next section.

4.2. Delphi study results: research trajectories of S-D Logic

The findings of the Delphi process support the results of the bibliometric study. The three pervasive research trajectories (Value Co-creation, Resources incl. Resource Integration, and Innovation) identified in the bibliometric study are considered motor themes by the expert panel as well, while brands and branding are deemed peripheral by both methods of inquiry.

Anchoring the findings of the Delphi study in the preceding empirical results allows us to confidently provide a deeper qualitative understanding with regards to important research questions that motivate the advancement of S-D Logic's research trajectories. We provide a list of research questions that were derived during the last phase of the

Table 4
Delphi Round 2, List of themes synthesized from expert responses collected in Delphi Round 1.

1. Actors	8. Engagement	15. Resources
2. Branding	9. Innovation	16. Service
3. Business model	10. Institutions	17. Social network marketing
4. Co-creation of service	11. Markets	18. Systems
5. Context	12. Networks	19. Value co-creation
6. Customer orientation	13. Organizational integration	20. Value proposition
7. Customer perspective	14. Platforms	

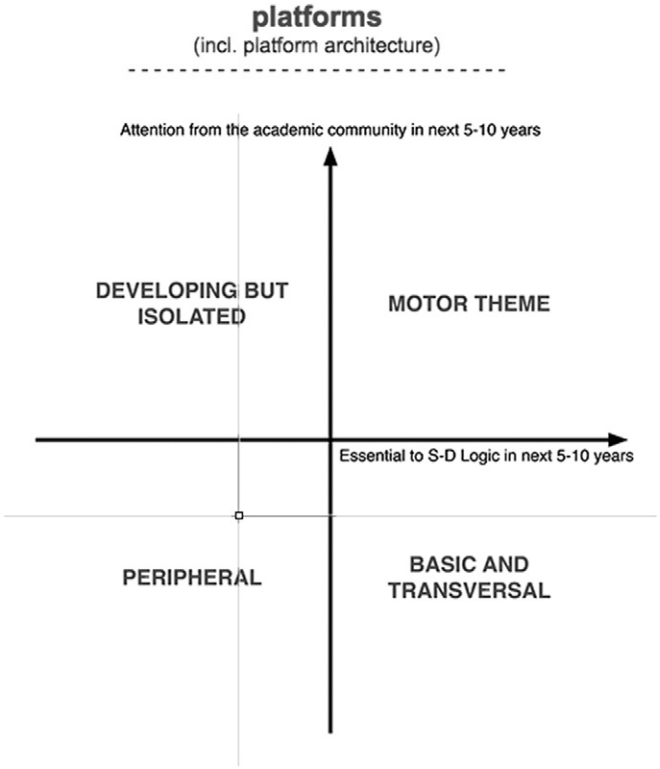

Fig. 4. Delphi Round 3 survey instrument, with crosshair for "Platforms" theme placed in the lower left "Peripheral" quadrant. Quadrant descriptions were provided to participants at the beginning of the task and continually available for reference below each of the coordinate grids: a) Motor theme - these driving themes will both receive attention from the academic community and will be essential to S-D Logic in the next 5–10 years. b) Basic and transversal theme - these themes will receive less attention from the academic community, however they will be essential to S-D Logic in the next 5–10 years. c) Developing but isolated - these themes will receive attention from the academic community, but will not be essential to S-D Logic in the next 5–10 years. d) Peripheral theme - these themes will receive less attention from the academic community and will become peripheral to S-D Logic in the next 5–10 years.

Delphi process in Appendix B. Grouping the questions by philosophical categories reveals that the academic community is still evaluating fundamental ontological and epistemological questions, which aim at defining the boundaries of the main concepts as well as their operationalization. Further categorization into relationalist, pluralist, holistic, emergentist, and reductionist questions provides an overview of the complex structure of current scientific debates motivated by S-D Logic. Apparently, there is demand for studies that focus on different levels of aggregation (micro-, meso-, macro-levels) as well as their interplay that would be addressed by holistic, emergentist and reductionist approaches. Furthermore, experts call for studies that apply to various levels of abstraction, and contribute to the development of meta- and midrange theory (Vargo & Lusch, 2016b). Overall, the suggested research questions indicate that contributions to the unifying paradigm emanate from a wide variety of philosophical standpoints and concern various levels of aggregation and abstraction. In other words, not all research that advances the paradigm necessarily needs to take a holistic or unifying stance. With that in mind, we expect that the research trajectories identified as well as their emergent themes reduce epistemological complexity and facilitate the development of theory in S-D Logic.

Before synthesizing our findings and proposing a list of emergent higher order themes that characterize the unifying paradigm associated with S-D Logic, we present each of the research trajectories listed in descending order of their centrality score (Appendix A) with a summary of its main tenets, relevant literature, and synthesis of the research questions suggested by the expert panel. The following review points out the central debates spurred by S-D Logic with an interdisciplinary scope. Such overview is crucial to contextualize the research questions raised by the expert panel, to map the boundaries of the paradigm, as well as to clarify the interrelationships between its key concepts. Facilitated by the unifying qualities of the S-D Logic paradigm, the associations and emergent themes across literatures become evident.

4.2.1. Systems

Systems thinking has been an integral part of S-D Logic for a few years (Vargo, Maglio, & Akaka, 2008) when the field adopted a "systems perspective of the market" (Vargo & Lusch, 2011) or service-ecosystem approach, also referred to as systems of service systems. Essentially, the service-ecosystem view emphasizes that multiple levels of interaction need to be taken into account simultaneously when studying complex service systems, service exchange and value creation (Chandler & Vargo, 2011). As such, both the behavior of single actors in the micro-level as well as those on the macro-level can be better understood by oscillating between different levels of aggregation and employing a systemic view of value co-creation (Vargo & Lusch, 2011). Edvardsson, Tronvoll, and Gruber (2011) discuss the expansion of the understanding of service exchange from a social constructivist perspective and suggest the inclusion of social systems to S-D Logic thought.

In a service-ecosystem approach, a car sale is not about the mere legal transaction of property from one owner to the other, but about a complex constellation of events influenced by several institutions (regulators, brand communities), technologies (symbols and processes), and resources (knowledge and social roles). Thus, service ecosystems do not only consist of (generic) actors, but also of tangible and intangible artifacts (Lusch & Spohrer, 2012), which both facilitate and constrain value co-creation (Åkesson, Edvardsson, & Tronvoll, 2014).

The research topics suggested by the expert panel aim at describing, delineating and identifying relevant service (eco)systems and their dynamics. The expert panel also suggests extending the systems approach in S-D Logic with advances in the viable systems perspective, stakeholder theory, and network theory.

4.2.2. Value proposition

By definition, value propositions engage actors in novel interaction or ongoing relationship with the service provider (Payne & Frow, 2014b). These value propositions enable connections between various service systems (Vargo et al., 2008). As a consequence, value propositions are not only promises or proposals made to individual actors, but they can act upon the very nature of interactions and practices in the market. S-D Logic literature has recently linked value proposition design with business model innovations (Gebauer, Worch, & Truffer, 2012; Maglio & Spohrer, 2013; Storbacka & Nenonen, 2014). For instance, Maglio and Spohrer (2013) conceptualizes business model innovation as value proposition design, describing it as "a systematic search process that providers can perform to improve existing offerings, create new offerings, and reconfigure their ecosystems." Follow-up research effort along these lines is probable with the goal to elaborate on the understanding of value propositions and how they are interpreted within a service ecosystem.

The research topics suggested by the expert panel focus on investigating the content of value propositions and developing means to describe their characteristics on various contextual layers. Overall, a desire to connect value propositions to other conceptual cornerstones that are enumerated here is evident.

4.2.3. Value co-creation

The concept of value is an integral aspect of S-D Logic with emphasis on (contextual) value-in-use as opposed to G-D logic's (transactional) understanding of value-in-exchange. The roots of this perspective can be traced back to a shift from the traditional firm-centric view of goods production to an interest in studying the co-creation of customer experiences (Prahalad & Ramaswamy, 2004). In S-D Logic, value is

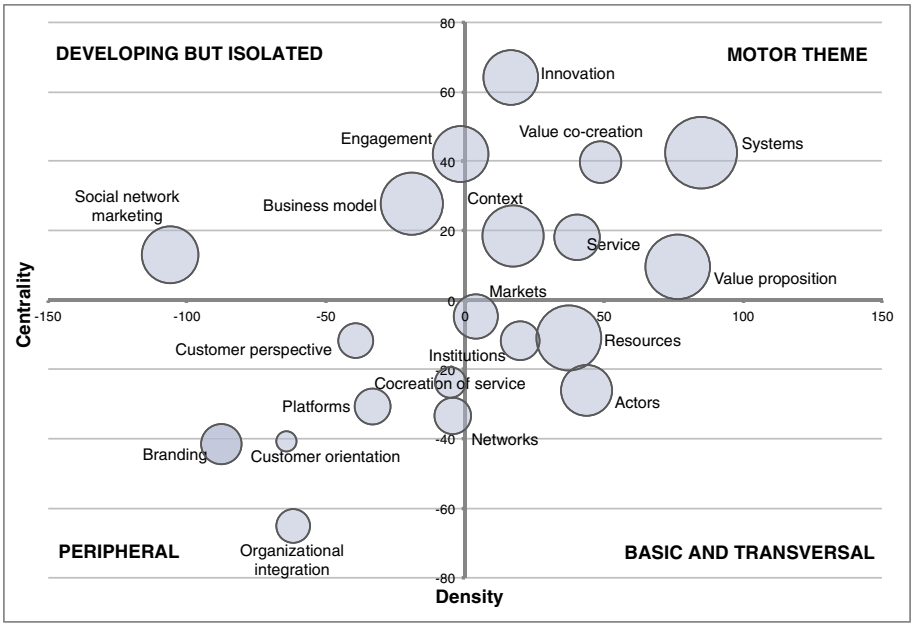

Fig. 5. Normalized Delphi themes plot generated from Round 3 responses. Diameter represents agreement score calculated from standard deviation of centrality and density scores. A larger circle denotes stronger expert agreement regarding the development and importance per concept. Central concepts in the right two quadrants are discussed in detail as research trajectories of S-D Logic.

conceptualized as "value-in-context" (Vargo & Lusch, 2008a, Vargo et al., 2008) or "value-in-social-context" (Edvardsson et al., 2011). As such, value is not merely exchanged with other actors, but it is co-created in use in context. Initially, co-production and co-creation of value were used synonymously in S-D Logic (Payne, Storbacka, & Frow, 2008; Vargo & Lusch, 2004). However, there is an ongoing discussion regarding the fundamental differences between the creation and the co-creation of value. Grönroos (2011) considers that value is co-created only in interaction between actors, i.e., by means of "a physical, virtual, or mental contact, such that the provider creates opportunities to engage with its customers' experiences and practices and thereby influences their flow and outcomes" (Grönroos & Voima, 2013). In contrast to the aforementioned Nordic school of thought, the service-ecosystem approach proposes that actors in service ecosystems are not only connected in direct interaction but also connected by signs and symbols that guide actors in pursuit of value co-creation, by means of coordination of interactions, communication of information, integration of resources, and evaluation of value (Akaka et al., 2014). Thus, it has become apparent that symbols, embedded within the context of broader institutions, are central to value co-creation as they enable and constrain action and interaction among resource-integrating actors. In other words, actors are connected to other actors on different levels of service ecosystem: from dyadic interaction on the micro-level to shared networked institutions on the macro-level, from the small world to the wider world (Ford & Mouzas, 2013).

The questions raised by the expert panel suggest that there is still uncertainty revolving around the key definitions of co-created value and value co-creation as a process. The suggested research avenues for further inquiry indicate that the basic definitions, limitations, and measurements pertaining to value and value co-creation still need to be unearthed. In addition, the experts seek to understand the motivations of actors to engage in value co-creation, its boundaries, and the possible influences of alternative driving factors.

4.2.4. Actors

The core concepts of S-D Logic point to a generic actor conceptualization as opposed to attributing different activities to specific actors (i.e. producers only produce, consumers only consume). The generic actor conceptualization suggests that on a basic level all economic and social actors are engaging in essentially the same activities, ranging from resource integration to value co-creation (Vargo & Lusch, 2011). As stated in Andersson et al. (2008, p.67) "Actors are entities to which actions are ascribed, ex post." More simply put, actors are not, they become. They come into existence when other actors recognize them in some capacity or when they are made obvious via instances of practical interactions. In addition, an actor is able to represent itself differently in multiple situations. These entities are not simply a priori determined sellers or buyers in the market, but they are humans and firms (both actors) engaging in varying constellations of practices. This view links the generic actor conceptualization with the notion of market practices and with the performativity of markets (Kjellberg et al., 2012), which means that markets exist only as they are enacted. Moreover, the adoption of a social practice approach in marketing encourages the study of the role of non-humans as actors (or actants) and the potential role of material agency, too. This means that agency is afforded to nonhuman and material actors (Pickering, 1993) as well. While deemed important by the expert panel, agency and actants are only tangentially discussed in the extant S-D Logic literature, with the exception of Kieliszewski, Maglio, and Cefkin (2012), which employs a progressive model of complex service systems by visualizing the relationship between various actors and nonhuman actants, including weather and traffic data.

The research questions raised by the expert panel call for a pragmatic taxonomy for actors and non-human actors (actants), as well as a classification and representation of their roles and types of engagement. Other questions aim at expanding the current understanding of the function of actors beyond their prevailing conceptualizations.

4.2.5. Service

The notion of service has unquestionably been at the heart of value-creation, exchange, and markets since the infancy of S-D Logic. Important conceptual development is captured in Gummesson (2007) where the term service is used as a synonym for value, and by Vargo and Lusch (2008b), in which the singular *service*, i.e. "application of specialized competences (operant resources—knowledge and skills), through deeds, processes, and performances for the benefit of another entity or the entity itself" is differentiated from the plural *services*, i.e. "units of output". It has been clarified later on that *service* is "the basis for all exchange", and "exchanged for service" (Vargo & Lusch, 2014).

Edvardsson et al. (2011) highlighted the role of social context in service exchange, suggesting that resources that are integrated in the service provision process are also social constructions. In other words, resources are not, but they become, as they are integrated and applied in service. However, the various ways in which resources are integrated and service is exchanged do not exist in a vacuum, but are embedded in social context, and influenced by market practices. For instance, in the electric vehicle market, it is evident that auto sales regulations, tax bonuses, brand communities and several other aspects of the social context all influence how and why a car is bought and later used, and how service and value are co-created and determined in forms other than transportation only.

Despite the progress with regards to the conceptualization of service, the research topics suggested by the expert panel range from broad questions such as defining service for practical purposes to specific questions regarding the link between related concepts, and the measurement of service flows and their intensity.

4.2.6. Resources

According to S-D Logic's tenets, resources become effective when integrated with other operand or operant resources. Recently Edvardsson, Kleinaltenkamp, Tronvoll, McHugh, and Windahl (2014) noted that the process of resource integration itself as well as the coordination of resource-integrating actors remained largely understudied. In addition, the authors examine whether technology provides an operant resource, that is, whether a resource is capable of acting on other resources to create value. As a simple illustrative example, the knowledge of driving cars can be applied on an electric car, and both resources combined create value in the form of transportation.

Continuing this line of thought, Akaka and Vargo (2014) recently conceptualized technology as an operant resource. The authors do not consider technology as a mere object of human action or as a machine with potential agency, but as a complex set of symbols, practices and processes that have been integrated to serve a specific human purpose. With this wider scope of conceptualization, technology can refer to anything ranging from a simplistic traffic light switch to intelligent systems of traffic queuing, which enable smooth transportation on public roads by using information sourced from a larger sensory network.

First, this can be seen as a continuation to Akaka and Chandler's (2011) "roles as resources" approach in which social roles are conceptualized as resources that can be drawn upon to initiate change in service ecosystems. Second, their thinking is in line with Edvardsson et al. (2014) who built on the institutions literature suggesting that regulative, normative and cognitive institutions, as well as institutional logics influence the use of resources and the coordination of resource integration processes. Thus, these contributions incrementally foster an expanded understanding of how practices influence resource integration. Yet, Peters et al. (2014) criticize that many research publications on resource integration only pay little explicit attention to the actual process of theorizing including the evaluation of the philosophical assumptions that guide theorizing.

The research topics suggested by the expert panel appear highly fragmented, indicating that scholars see opportunities for the development and debate of the concept of resources. Furthering understanding of this key concept would enable contributions in other related domains of S-D Logic research.

4.2.7. Institutions

Defined as humanly devised rules, norms, and meanings; institutions enable and constrain human action (Scott, 2001). Over the past few years, institutions have become more central to the development of S-D Logic as they relate to market practices (Kjellberg & Helgesson, 2007; Kjellberg et al., 2012), and their associated signs and symbols (Akaka et al., 2014). Institutions influence the very use of resources and the coordination of their integration for the purpose of value creation (Edvardsson et al., 2014). As a consequence, institutions indirectly influence the context of the creation of value and its assessment (Akaka, Vargo, & Lusch, 2013; Chandler & Vargo, 2011). The principal tenet is that the value co-creating actions of resource-integrating actors are not only simultaneously enabled and constrained by multiple institutions, but that the actions of these actors form and reproduce these institutions, analogous to Giddens' (1984) duality of structure. Thus, actors are not merely following the "rules of the game" but are very well capable of engaging in the process of institutional change (North, 1990; Scott, 2010). Consequently, actors are more or less intentionally engaging in the process of institutionalization, creating and shaping markets, that is, institutionalized solutions (Edvardsson et al., 2011; Vargo & Lusch, 2014; Vargo, Wieland, & Akaka, 2015).

Given that markets, context, innovations, and service ecosystem are intertwined with institutional thinking, the expert panel's questions suggest focusing efforts on furthering the understanding of the relationship between institutions and practices, their measurement, as well as describing the lifecycle and process of institutionalization and deinstitutionalization. Since institutions are crucial to conceptualizing service ecosystems, illuminating their interrelationship can positively affect our understanding of service exchange, and thus value creation.

4.2.8. Context

The notion of context became an integral part of S-D Logic when the perception of value shifted from value-in-use to value-in-context (Vargo & Lusch, 2008a). Since then, more conceptual work has illuminated how context frames exchange and markets (Chandler & Vargo, 2011). Contextual differences in exchange phenomena are explained by the variety of engaged actors, diversity of resources, multiplicity of institutions, and the plethora of practices that are involved. On these different conceptual levels of context, we can frame exchange or an event from the relatively limited perspective of a single actor or zoom out to a wider perspective that encompasses relationships, networks, markets and institutions. The literature on service ecosystems and institutions is instrumental to progressing our understanding of context. For instance, a conceptual study by Akaka et al. (2013) establishes the link between S-D Logic's apprehension of context and the vast extant literature on culture, consumption, as well as associated symbols and institutions.

The research topics suggested by the expert panel aim at creating a more finely granulated understanding of context, that is, what is context, what does it consist of, how are its elements linked, and how can it be studied?

4.2.9. Innovation

In S-D Logic, the foci of studies on innovation range from the networked nature of interaction on the micro-level (Gustafsson, Kristensson, & Witell, 2012; Perks, Gruber, & Edvardsson, 2012) to the meso-level dynamics in market practices (Storbacka & Nenonen, 2012). Innovation studies by leading S-D Logic scholars link innovations to value propositions (Payne & Frow, 2014a) or to technology, which itself is conceptualized as a resource characterized by potentially useful knowledge (Vargo et al., 2015). When a value proposition or technology becomes an institutionalized solution, it is referred to as a market (Vargo et al., 2015). The service-ecosystem approach organizes these compatible notions of technology and market, thus extending the research on innovation systems. In particular, the integrative service-ecosystem approach to innovation opens up avenues to realizing a better understanding of the dynamics within complex systems. For instance, the aforementioned approach to understanding the reciprocal influences of market systems includes a potentially larger, more complex set of biological, social, economic, and environmental systems (Maglio, Sepulveda, & Mabry, 2014; Spohrer & Maglio, 2008) that was hitherto disregarded as external. This enhanced systems view is also termed as "the context of the innovation" in Waluszewski, Ingemansson, and Håkansson (2014).

Overall, the proposed questions of the expert panel indicate that a more holistic understanding of innovations informed by a service-

ecosystem perspective is desired to advance the field. A conceptual perspective that has the capacity to concurrently combine technology and market innovation, enables and fosters a discussion about the role of actors and their interaction on a micro-level as well as the role of institutions on a macro-level to various aspects of innovation.

4.2.10. Markets

Being able to define and understand markets is a prerequisite for the marketing discipline. The interest in examining the eponymous concept has led researchers to pose the question "What do marketing scholars need to know about markets?" (Kjellberg et al., 2012) and propose the development of a positive theory of the market based on S-D Logic (Vargo, 2007). Opposed to the traditional conceptualization of markets in which markets are seen as purely transactional/static and goods/firm-centric, the S-D Logic perspective puts forward that markets are dynamically enacted through ongoing interactions between various resource-integrating actors that are seeking to create value for themselves and others. Most of all, it is understood that markets are constituted by actors (Storbacka & Nenonen, 2012) engaged in market practices (Kjellberg & Helgesson, 2006, 2007) as opposed to a market conceptualization based solely on transactions. For the advancement of marketing scholarship, Kjellberg et al. (2012) suggests that more research is needed to better understand market practices, how markets are interpreted, and how they are being shaped. Along these lines, Nenonen et al. (2014) proposed the concept of market plasticity, which describes "the market's capacity to take and retain form." This novel perspective on market dynamics suggests that practitioners need not resign themselves to take markets as immutable constructs, but can instead view themselves as powerful actors with the necessary agency to change prevailing market practices from within. In the traditional car market for example, specific sets of rules have been created over the past century by actors such as manufacturers, regulators, oil companies, and brand communities. As such, these ingrained institutionalized structures make it difficult to disrupt the market with a unique business model. However, we are witnessing new markets, such as electric vehicle markets, that are yet to develop their own rules of the game. Naturally, these markets are not independent of each other, but allow opportunities for startups as well as established firms to shape market practices. The scholarly activity in and around S-D Logic gives rise to institutional approaches to markets, which counteract the traditional marginal view of markets. These novel combinatory approaches enable marketing and management scholars to create a theory of markets that advances meaningful and relevant applied research.

The research topics suggested by the expert panel focus on developing common means to describe and measure temporal and structural market characteristics, such as their emergence and evolution, their boundaries, location, level of institutionalization, plasticity, and fragmentation. Other questions aim at investigating the functional and causal relationships between these characteristics and their drivers, as well as deriving practical performance metrics.

5. Emergent higher order themes of S-D Logic

All in all, the aforementioned trajectories can provide research priorities for the examination and development of S-D Logic. Apparently, more work is required on the level of basic conceptual development, as evinced by the ontological, epistemological, relationalist, and pluralist expert questions (Appendix B), which hint at the absence of commonly agreed-upon definitions and the fuzzy boundaries for a number of concepts on different levels of abstraction. The itemization of the questions into holistic, emergentist and reductionist categories supports the suggestion that there is demand for studies that focus on different levels of aggregation (Vargo & Lusch, 2016b). Overall, the suggested research questions indicate that contributions to the unifying paradigm emanate from a wide variety of philosophical standpoints and concern various levels of aggregation and abstraction.

Fostering a possible consensus on conceptual foundations across disciplines can enable discussions to more effectively cross disciplinary boundaries with regards to their interrelations and connections. As we conclude the empirical analyses, we offer an interpretation of the themes and links that we see emerging among the identified research trajectories and suggested research questions. These interpretations are entirely speculative and merely conjecture themes that may aid in motivating future research. The higher order themes that we see emerging from the content of the scholarly activity we reviewed concern a) the study of complex and fractal phenomena that b) necessitate generic conceptualizations, c) and; the technological innovation and democratization processes that d) affect institutionalization practices.

5.1. Complex and fractal phenomena

We suggest that S-D Logic generally motivates the study of higher order conceptualizations in the business and management sciences which foster academic and practical insights for understanding and managing complex dynamic environments across a variety of real-world and conceptual levels that are often unstable und unpredictable (Urry, 2005). Tackling research endeavors in modern global business environments necessitates the recognition of their inherent complexity; thus Lee, Collier, Cullen, and Gummesson (2007) advocate methodological creativity in order to transcend limitations of methodology and discipline. Aptly, Holbrook (2003) provides a review of the applicability of complexity theory and fractal patterns to business environments. The theme of complex and fractal phenomena resonates with the actor, resources, and systems trajectories.

5.2. Generic conceptualizations

The emergent themes we present here allow readers to contextualize S-D Logic holistically across a breadth of disciplines and they may guide the reader's recognition of commonalities that transcend disciplinary boundaries. For example, findings with regards to the *Actor* concept and its role multiplicity point towards the necessity of generic conceptualizations that can capture the nature of fluid entities in market spaces whose roles and functional relations are constantly shifting within their ecosystems depending upon their various contexts (Finch & Geiger, 2011; Kallinikos, Aaltonen, & Marton, 2013). One of the challenges here lies in formulating useful definitions to tackle the complexity that emanates from current *Actor* and *Resource* network conceptualizations guided by S-D Logic. The theme of generic conceptualizations references the actors, context, markets, and resources trajectories.

5.3. Technological innovation and democratization processes

Furthermore, technological innovations such as digitalization and virtualization produce increasing system complexity, also expressed in the fluidity metaphors (Urry, 2005) pertaining to the confluence and mixing of networks of people, machines, algorithms, representations, and information in digital spaces. Such digitalization fosters extended network confluence for service delivery and was anticipated by Normann's service logic and the idea of liquefaction (Lusch & Nambisan, 2015; Michel, Vargo, & Lusch, 2007). Enabled by the aforementioned digitalization are collaborative digital systems or open contribution structures that – among other things – democratize innovation (Von Hippel, 2009), production (Powell, 2012), and entrepreneurship (Davidson & Vaast, 2010), as well as diffusion of and access to scientific discoveries (Mention, Ferreira, & Torkkeli, 2016). The theme of technological innovation and democratization processes emerges from the trajectories concerning actors, innovation, institutions, resources, service, value proposition, and value co-creation.

5.4. Institutionalization practices

These democratization practices (Coccia, 2010) across a variety of domains enable the lean and agile institutionalizing processes referenced by the S-D Logic expert panel. These dynamic reconfiguration processes within institutional spaces are often produced by and produce innovation (Bogers et al., 2016; Vargo et al., 2015). Underlying the academic inquiry into the aforementioned emergent themes is perhaps a shared understanding about their inherently complex nature. This article itself can serve as an example of the fractal nature of scholarly resources and their interactions with and across various conceptual levels. To fully appreciate the dynamic nature and scalable influence of these fractal phenomena, a conceptual oscillation across various foci is often necessary (Chandler & Vargo, 2011). Nonetheless, the disciplinary transcendence sought and perhaps required to assemble an elusive *Logic of Everything* seems overwhelming. However, this insight generates the farsighted calls for the unification paradigm (Lusch et al., 2009) that enables an informed understanding of the true nature of economic exchange. The utility and acceptance of one unifying paradigm and its truth are yet to be determined by the scientific community. Similar ideas are reflected upon in a review by Ng, Badinelli, Polese, Di Nauta, and Löbler (2012), which proposes that service researchers should identify a common problem – a service challenge – that could potentially unify the interdisciplinary field.

While not exhaustive, the findings presented here support the importance of systems thinking as a future research trajectory for S-D Logic. The results reveal the emphasis of integrative approaches and narratives, particularly the institutional approach that integrates symbols, processes, and practices (Vargo & Lusch, 2016a). The institutional approach explicitly distinguishes S-D Logic from the service logic produced by the Nordic school of marketing (Grönroos, 2011). Instead of focusing on the micro-level interactions emphasized by the Nordic school, S-D Logic proposes oscillation between different levels of aggregation in order to gain a more informed understanding of economic exchange and value creation in the whole service ecosystem.

6. Conclusion

We set out to describe the research trajectories of the S-D Logic paradigm in order to gain an understanding of the paradigm's thematic boundaries and its central areas of scholarly interest. Our deliberations explore the paradigmatic qualities of S-D Logic from two methodological angles. The combination of bibliometric mapping of research trajectories in S-D Logic with qualitative support from an expert panel not only provides value for researchers interested in the development of the unifying paradigm, but equally importantly opens up avenues for practitioners to view their operations through the lens of a developing paradigm.

For instance, using a conceptual S-D Logic lens, Breidbach and Maglio (2016) empirically investigate how information and communication technologies change the traditional service interactions, which are crucial to business and management. Reypens, Lievens, and Blazevic (2016) address the collaborative challenges firms face when co-creating innovative value in an environment of increasing market dynamism and complexity. The authors call for a systems approach to value co-creation processes, among other things, pointing out the limitations of linear conceptualizations such as the structural equation modeling often employed to describe business processes. Such broadening of the current conceptualizations and methodological approaches may provide practitioners with better tools to understanding managerial practice at various levels (Fjeldstad, Snow, Miles, & Lettl, 2012).

Kjellberg, Azimont, and Reid (2015) discuss the central role of institutionalization in market innovation processes. The authors' perspective acknowledges markets as ongoing processes, rather than as an exogenous force (i.e., demand) that is beyond the sphere of influence of actors in the market. This perspectival change can empower actors' prospects of actively promoting and/or preventing changes in the market. Potential future training programs based on the research trajectories in this unifying paradigm would provide managers with a holistic view of the market ecosystems within which they operate, as well as assisting them in better navigating and managing these complex and dynamic environments.

The contribution of this article is four-fold: First, we provide a bibliometric analysis of the development of the S-D Logic literature over the past decade (2004–2014). This empirical inquiry reveals the structure and, to some extent, the content of the scientific debate spurred by the introduction of S-D Logic. The bibliometric study highlights four pertinent research trajectories within S-D Logic, namely *Value co-creation*, *Resources* (*incl. integration*), *Brands*, and *Innovation*. Academic activity related to S-D Logic has taken place along these research trajectories over the past decade. The bibliometric study reveals that the majority of these trajectories have become increasingly important to the S-D Logic paradigm over the course of the last three years of the period under study.

Second, by conducting structured interviews with a S-D Logic expert panel, we identify and qualitatively investigate 10 concepts that are likely to contribute to the development of the S-D Logic paradigm in the immediate future (Actors, Context, Innovation, Institutions, Markets, Resources, Service, Systems, Value co-creation, Value proposition). Out of these concepts *Value co-creation*, *Resources* (*incl. integration*), and *Innovation* are expected to remain central research trajectories, thus confirming their positive developmental trend identified by the bibliometric study. In order to connect the retrospective findings of the bibliometric study to the prospective Delphi study, we adapt the concept of network centrality and density to gauge the future locus of academic inquiry regarding these research trajectories. Taken together, these results support the semantic congruence between the research trajectories identified in the bibliometric study and the Delphi study.

Third, we provide an avenue for potential future academic inquiry to further develop S-D Logic. The commonalities among the expert panel's research questions underscore the observed shift towards systemic and institutional marketing conceptualizations postulated in S-D Logic. The philosophical categorization of the suggested research questions indicates that contributions to this unifying paradigm can originate from a wide variety of philosophical approaches. From the entirety of our findings we tentatively distill emergent higher order themes that evidently motivate the development of S-D Logic and related fields (complex and fractal phenomena, generic conceptualizations, technological innovation and democratization processes, and institutionalization).

Finally, our efforts represent a novel methodological approach to evaluate research trajectories of paradigms in the business and management sciences in particular, and any type of integrative discipline in the social sciences in general. The common higher order themes that emerge from the S-D Logic paradigm may inform an advanced understanding of the nature of economic exchange and value creation for the business and management sciences. The nascent academic consensus regarding a unifying paradigm can foster effective scholarly engagement with regards to disciplinary interrelations and connections in terms of their fundamental concepts, thus enabling the transdisciplinary production of knowledge.

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Appendix A. Centrality, density and composite agreement score statistics (Delphi Round 3)

Theme	↓Centrality	SD	Density	SD	Agreement
Systems	85	(59)	43	(95)	1.39
Value proposition	77	(58)	10	(113)	1.25
Value co-creation	49	(113)	40	(114)	0.94
Actors	44	(99)	−26	(106)	1.04
Service	40	(120)	18	(98)	0.98
Resources	37	(65)	−11	(105)	1.26
Institutions	20	(124)	−12	(110)	0.91
Context	17	(100)	19	(79)	1.19
Innovation	16	(116)	64	(79)	1.09
Markets	4	(113)	−5	(108)	0.97
Engagement	−2	(94)	42	(99)	1.11
Networks	−5	(110)	−33	(130)	0.89
Cocreation of service	−6	(137)	−24	(118)	0.84
Business model	−19	(984)	28	(93)	1.21
Platforms	−33	(129)	−31	(113)	0.88
Customer perspective	−40	(104)	−12	(140)	0.87
Organizational integration	−62	(121)	−65	(126)	0.86
Customer orientation	−64	(150)	−41	(130)	0.76
Branding	−88	(125)	−41	(106)	0.93
Social network marketing	−106	(111)	13	(80)	1.12
Mean	0	107	0	107	1.00

Note: Centrality and density score are mean centered. Agreement score expressed as reciprocal of the mean of combined standard deviations ($107 / ((SD_{Centrality} + SD_{Density}) / 2)$). A higher agreement score (larger circle in Fig. 5) thus indicates a higher amount of agreement regarding a theme's positioning.

Appendix B. Philosophical categorization of expert panel questions (Delphi Round 4)

Ontological
What are the ontological levels (e.g. subjective vs. objective) of context?
What are the boundaries of a market?
What are the characteristics (e.g. plasticity, location, fragmentation) of a market?
What are the definitions, forms and limits of value and value co-creation?
What are the different characteristics (e.g. social, cyber and physical layers, dynamically reconfigurable, contextually aware) of value proposition?
What are the boundaries and linkages of a service (eco)system?
What does service mean in practice?
How is innovation defined in a service ecosystem?
How to represent actors in a more focused and pragmatic manner?
How does system perspective enable different views of value propositions?
How to re-interpret value propositions with a service science perspective?
Epistemological
How can we measure or operationalize context?
How can we know if a market is performing well?
How can we measure institutions or institutional logics?
How can we quantify service flows?
How do we determine the relevant system of analysis?
How can we measure value?
How can we know who creates value best?
Relationalist
How are multiple contexts (e.g., personal, market, societal) reconciled?
How does service relate to technology?
How do we separate value from values?
Is co-creation of service the same as co-creation of value?
Who should do what in service: a supplier, a customer, a machine, a supportive infrastructure?
Pluralist
What different types of resources exist?
How can we classify types of service?
What are the engagement logics of various actors?
Are there other essential functions of actors for understanding value creation besides service-for-service exchange and resource integration?
How do various kinds of interaction enable resource sharing?
How can actor roles be meaningfully classified (i.e., other than producer and consumer) to advance the understanding of value co-creation?
How does value differ for different actors?
Do firms have different value propositions to different actor groups?
Holistic
How do the roles that actors perform influence their actions in a service ecosystem?
Which institutions are needed to support service?
Which institutions are hindrances for service?
How does market institutionalization result from and contribute to innovation?
How do individuals maneuver/adjust to the dynamics and overlapping nature of service (eco)systems?
What is the role of institutions, institutionalization, and shared institutional logics in the emergence and diffusion of value propositions and of innovation in technology, markets, and business models?
Emergentist

Appendix B. (*continued*)

How do markets and service (eco)systems emerge and evolve?
How do value propositions change as a market evolves?
How do potential resources gain 'resourceness'?
How can markets become unbounded and plastic?
What is the role of non-human actors (actants) in a service ecosystem?
What is the role of different actors in the innovation process?
Is institutionalization a "combinatorial evolution" process, i.e., are new institutions formed from recombinations of prior institutional structures?
How do institutions emerge, maintain and decay (deinstitutionalize)?
Reductionist
What key characteristics of service (eco)systems determine their survivability/viability?
What are the key drivers/conditions for the massively co-created value that characterizes global wellbeing?
What factors determine the institutionalization of potential institutions?

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