

Value Appropriation Perspective in Collaboration Dynamics: An Agenda for Future Research

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Competitive paper

Abstract

The recently surged researches on the intersection of collaboration dynamics and value appropriation suffer from inconsistencies and from the lack of theoretical articulations as well as conceptual foundations. It is a challenge, as without being able to understand the roles that collaboration and appropriability play and the meaning of their connectedness, an attempt to manage collaborative value creation becomes burdened with flawed decision processes and misplaced activities.

Our study aims to provide direction to address this gap. Based on a review of literature, we track the history of value appropriation research in relation to collaboration dynamics. We bring elements from network research into this consideration, and develop a framework linking network research and profiting from innovation, in particular. We find that although extant research has perceived value appropriation as closely related to the collaboration activity, it has failed to fully articulate the interactive dynamics in collaboration for value appropriation and the role of appropriation in network dynamics. Building on the observations, we propose important unaddressed research questions to help stimulate and guide future research in this frontier. In particular, we illustrate the scholarly potential of disentangling multi-actor network orchestration, of studying the process interactions between value appropriation and collaboration, and of exploring the leverage of collaboration for approaching goals.

Keywords: dynamic collaboration, value appropriation, interactive dynamic, innovation, network

INTRODUCTION

Previous research has revealed that since “a single organization cannot innovate in isolation” (Dahlander and Gann, 2010, p. 699), an organization has to engage with other actors to acquire ideas and resources for producing and sustaining innovations and for securing its competitiveness (Chesbrough, 2003; Blomqvist, Hurmelinna and Seppänen, 2005; Laursen and Salter, 2006). Among other things, involving other actors benefits an organization’s internal research and development (R&D) and innovation through expanding the organization’s opportunities of incorporating previously detached silos of knowledge and capabilities (Schumpeter, 1942; Hargadon and Sutton, 1997; Fleming, 2001; Dahlander and Gann, 2010).

In many previous studies, value creation side of innovation activities in business networks has received much attention, while value appropriation (capturing of realized value) has become a focal topic more recently with notions of “business deals” and “monetary flows” associated with business networks (Håkansson and Olsen, 2015; Perna, Baraldi and Waluszewski, 2015; Baraldi and Lind, 2017, p. 48). Particularly, appropriation problem – that is, the challenge of innovating actors to benefit from their creations – remains largely unexplored specifically in terms of operation and collaboration in the networked business environment. Until recently, value appropriation and capture have been associated more strongly with closed innovation modes (Chesbrough, 2003), and attempts of individual firms to protect their innovations against unwanted imitation (cf. Teece, 1986).

Yet, ensuring value appropriation for participants is critical for network orchestration (Dhanaraj and Parkhe, 2006; Ritala, Hurmelinna-Laukkanen and Nätti, 2012). The value capture theory (outlined by Gans and Ryall, 2017) reveals that value appropriated by every actor is determined by joint actions. It indicates that the value appropriated by each actor is closely related to the dynamics in the collaboration. While prior studies on business relationship dynamics have explained comprehensively the formation of relationships and networks at different levels (Hurmelinna, 2017), and have recognized that improving value is a shared objective that drives collaboration (Toikka, Miettinen and Tuunainen, 2016), this study contributes by providing background for exploring dynamics in collaboration for value appropriation. This research addresses the concern, that the recently surged researches on the intersection of collaboration dynamics and value appropriation suffer from inconsistencies and from the lack of theoretical articulations as well as conceptual foundations (Appleyard and Chesbrough, 2017; Bogers *et al.*, 2017).

This study utilizes systematic literature review approach to gain a view on the current situation on how value appropriation and collaboration come together and embrace dynamics not just on their own, but especially in combination. Our aim is to find out how current network literature treats appropriability, to what extent dynamics are acknowledged and understood, and what gaps the literature reveals in existing knowledge. Our further aim is to generate a relevant view on the existing knowledge, and suggest important research questions to help stimulate and guide future research in this frontier. Particularly, this study intends to complement the research of the Industrial Marketing and Purchasing Group (IMP Group) examining the complexity and dynamics of business relationships, by introducing value appropriation perspective (Jarratt and Ceric, 2015).

In the following, we first introduce briefly some central concepts and knowledge related to appropriation especially in innovation network context. We then describe the chosen methodology for our literature review, and present our findings. The paper concludes with suggestions for future research.

APPROPRIABILITY AND NETWORKS – AN OVERVIEW

Nowadays, networks are central for a range of activities such as procurement, internationalization, and innovation (Håkansson and Johanson, 1992). For instance, firms need to collaborate to access assets for innovation generation and new product/service development, or delivery channels for the created output (Perks and Jeffery, 2006). Consequently, it is not surprising that collaborative activities in the area of innovation have attracted interest.

The typical benefits sought through innovation networks are related to sharing risk arising from complexity and uncertainty, and obtaining adequate knowledge-based assets (Bullinger, Auernhammer and Gomeringer, 2004). Collective activities potentially produce notable synergy benefits. However, networking and cooperation – despite the form – inherently brings with its need of compromise, and it is not for granted that collaboration will be successful. In networks, relationships play an important dual role as a central source of benefits and as a potentially restricting factor to achieving individual, company-specific aspirations (Håkansson and Ford, 2002). In particular, taking into account the dynamics in the changing actor-specific goals and shifts in and between elements of networks, finding a balanced situation is not straightforward.

Among individual-oriented aspects, appropriation and value capture surface as important motivational and enabling factors for collaboration (Ritala and Hurmelinna-Laukkanen, 2009, 2013). On a general level, appropriability refers to participants' need to be able to benefit from being part of the collective – and avoid being hurt; otherwise they will either withdraw from sharing relevant knowledge and information, or they exit it completely, thereby causing instability (Heiman and Nickerson, 2004; Dhanaraj and Parkhe, 2006). Firm-specific knowledge and expertise is a major source of competitive advantage for companies. This knowledge can be used as leverage to attract collaboration partners that can respond to the needs of the firm, or it may be a relevant input for new developments. As an output, it can bring the profits to the firm. At the same time, the extent to which other organizations can extract and imitate this core knowledge and utilize it to their own advantage so that the competitive position of the firm is weakened, is of major concern for management (Spencer, 2003; Greenhalgh and M., 2004).

The challenge is, that this view has dominated research on these topics also. Much of current theorization on value capture and appropriation still resides within the boundaries of a single firm. Considering that scholars have advocated for a broader conceptualization of the 'firm' in general (e.g., Santos and Eisenhardt, 2005), and that a network has been proposed to be the locus of the innovation (Powell, Koput and Smith-Doerr, 1996; Adner and Kapoor, 2010; Autio and Thomas, 2014), we suggest that appropriation should be extended beyond the boundaries of a single firm to a wider extent than studies tend to do so far. It is not only about motivation or enabling knowledge transfer. Further, we suspect that the networked innovation environment makes it more likely that firms' appropriation strategies are dynamic, which still is an understudied issue (see also Appleyard and Chesbrough, 2017). We suspect that the inherent dynamics of innovation ecosystems and simultaneous collaboration and competition between various actors (Adner, Oxley and Silverman, 2013) are bound to affect both ability and willingness of firms to employ appropriation strategies that exhibit preclusion (exclusion of competition) and cumulateness (building on existing innovation) (Ahuja, Lampert and Novelli, 2013) to different extents (cf. Alexy, George and Salter, 2013; Jarvenpaa and Välikangas, 2014). Embeddedness in an innovation network implies that it is not necessarily a single organization that should be concerned about preclusion, but it may be that the boundary is shifted to the network level; those outside of the network are 'excluded' rather than those immediately outside the organizational boundaries. The network boundaries rarely are fixed,

however, which generates dynamism. Likewise, temporal changes may be present (Holgerson, Granstrand and Bogers, 2017).

At the moment, our understanding on firm's value appropriability (e.g., capturing a share of jointly created knowledge that can be used to its own advantage or to profit from innovation) in innovation ecosystems is still very limited. In order to get a better view of what is actually known, and where the gaps reside, we next turn to closer literature review. This review aims to uncover the framework for incorporating value appropriation perspective in innovation collaboration dynamics, and setting agenda for future research. When we examine the network literature, value appropriability is explicitly distinguished from value creation, which represents another value-based perspective of networks (c.f. Blyler and Coff, 2003; Adner and Zemsky, 2006; Lavie, 2007; Lepak, Smith and Taylor, 2007).

METHODS

THE METHOD – SYSTEMATIC QUANTITATIVE LITERATURE REVIEW

Established methods can be broadly categorized into the meta-analysis, narrative review, and (emerging) systematic quantitative review (Pickering and Byrne, 2014; Yang *et al.*, 2017). Meta-analysis is effective where studies it dealt with have comparable research designs (Mays, Pope and Popay, 2005; Borenstein *et al.*, 2009; Pickering and Byrne, 2014; Yang *et al.*, 2017), which is not the case of this study. While “traditional” narrative review method tolerates more the diversity of methodological approaches used in studies, it lacks malleability and reproducibility (Petticrew and Roberts, 2006; Borenstein *et al.*, 2009; Pickering and Byrne, 2014). Furthermore, as narrative review relies much on the expertise and authority of the reviewers, it risks from being highly subjective and hence biased (Borenstein *et al.*, 2009). In contrast to narrative review, the systematic quantitative review incorporates a more systematic, and quantitative approach, producing more comprehensive, reproducible as well as unbiased findings (Petticrew, 2001; Collins and Fauser, 2005; Pickering and Byrne, 2014).

Therefore, a systematic quantitative literature review method outlined by Pickering and Byrne (2014) is used in this research, to map and review existing studies in which value appropriation and collaboration dynamics are linked up. This “systematic quantitative approach” termed by Pickering and Byrne (2014) has been used to produce review papers in both natural and social sciences research fields, covering various topics such as ecological management, event management, and production management. It is especially suitable for the trans-disciplinary review, like this research, as this approach can be used to review the literature with various research designs as well as contexts. Its counting and charting what is known currently maps the scope and boundary of the current knowledge, articulating and illuminating not only the potential but also the most critical issues for future research (Pickering and Byrne, 2014; Pickering *et al.*, 2015; Yang *et al.*, 2017). As the aim of this review lies in mapping the intersection of collaboration dynamics and value appropriation in the exact literature and shedding light on future research avenues to explore this cross-disciplinary area, the systematic quantitative literature review method is supposed appropriate for this research (cf. Yang *et al.*, 2017; Sullivan, Thomas and Rosano, 2018).

To improve the quality of the reporting, the traceability of the process and the reproducibility of results, a flow diagram is recommended to record information on the phases from identifying databases to deciding studies for reviewing (Moher *et al.*, 2009; Yang *et al.*, 2017). With reference to the PRISMA flowchart (see Moher *et al.*, 2009), we therefore develop a sequential

diagram presenting the selection process of final primary studies from different databases (see Figure 2).

THE SYSTEMATIC REVIEW PROCESS

Figure 1 describes the systematic review process implemented in this research, which was adapted from Petticrew and Roberts (2006), Pickering and Byrne (2014) and Yang *et al.* (2017). The first author has contacted Pickering in person through emails and obtained guidance as well as resources (e.g. workshop slides and useful links) related to the systematic quantitative literature review method from her.

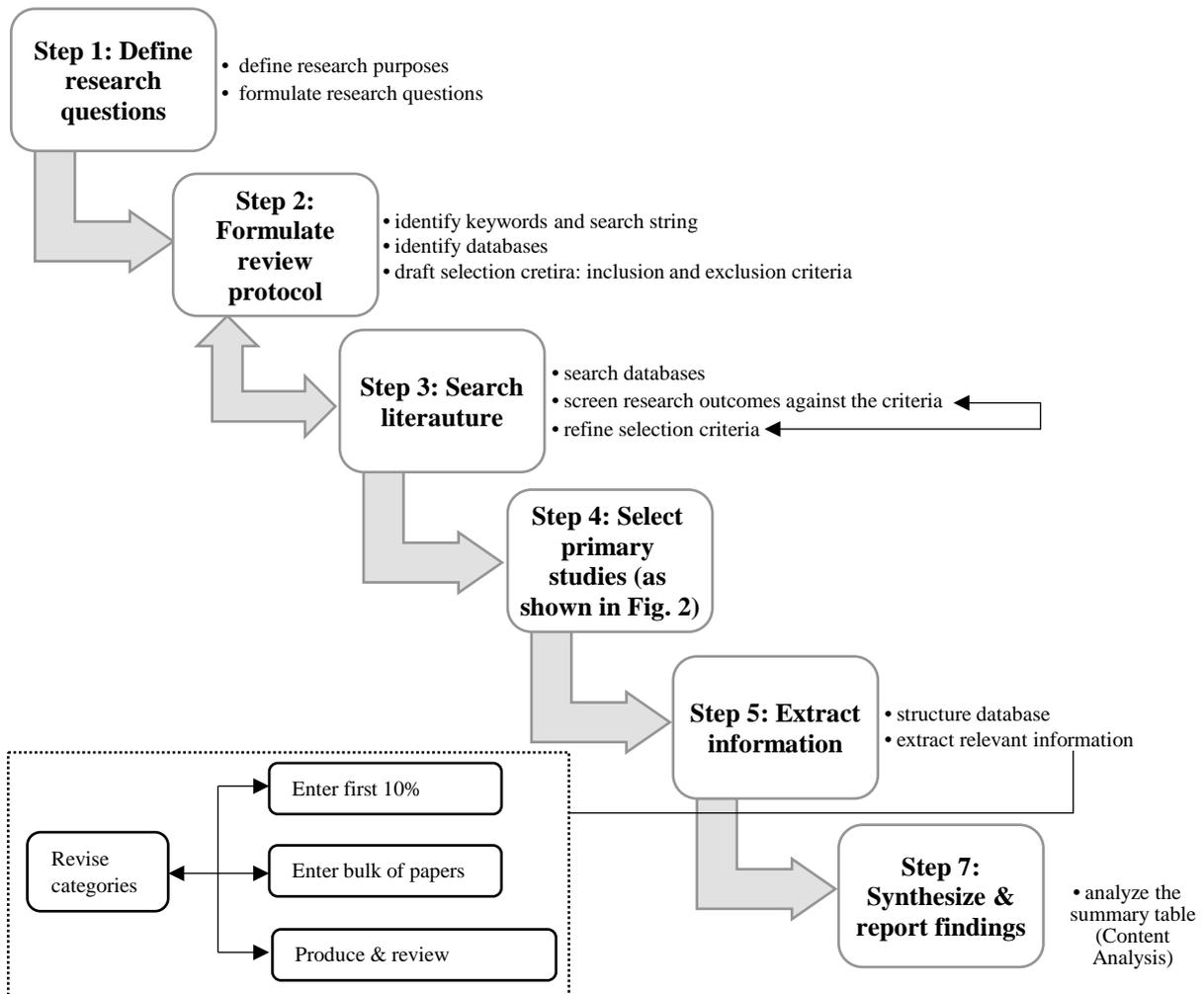


Fig. 1. Systematic review process

Source: Adapted from Pickering and Byrne (2014) and Yang *et al.* (2017).

Research purposes and questions

The review process starts with defining research purposes and questions. As aforementioned, the purpose of this research is to find out how current network literature treats appropriability, to what extent dynamics are acknowledged and understood, and what gaps the literature reveals in existing knowledge. Therefore, research questions we formulated as the base of this study are:

1. How does network literature treat appropriation concerning collaboration dynamics?
2. To what extent dynamics are acknowledged and understood currently?
3. What are the research gaps in the studies where collaboration dynamics and value appropriation are associated?

Identification of search string and databases

To define search string, synonyms of keywords (e.g. “cooperation” for “collaboration”) and terms that possibly stand for similar meanings in the literature (e.g. “knowledge production” for “value appropriation”) were listed first. After testing different wildcards and Boolean operators in databases of Scopus, Business Source Complete (EBSCO), and ABI/INFORM Complete (ProQuest) and screening the searching results, we left out certain alternatives and finally chose the string “((collaborat* OR network* OR relation*) AND dynamic*) AND (value AND (appropriability OR appropriation OR capture))”. The final searching alternatives are shown in Table 1.

Table 1
Searching keywords.

Keyword	Alternatives
collaboration dynamics	(collaborat* OR cooperat* OR network* OR relation*) AND dynamic*
value appropriation	value AND (appropriability OR appropriation OR capture)

Business Source Complete (EBSCO) and ABI/INFORM Complete (ProQuest) databases are used because “they focus explicitly on articles pertaining to the large domain of business studies” (Grégoire, Corbett and McMullen, 2011, p. 1449). Scopus database, a database across different research fields, is included as a reliability strategy to ensure that relevant literature (especially those in other research fields more than business field) is captured. During the identification process, a senior librarian was consulted to ensure that the searching string and the databases finally used are optimal.

Search process and study selection

Until 3rd March 2018, there are 2361 records in total resulted from the literature search in the aforementioned three databases. After exporting to Mendeley software for references management and removing duplicates retrieved from the databases, we screened the remaining 2022 papers against the selection criteria shown in Table 2.

Table 2
Selection (inclusion and exclusion) criteria used during selection.

Selection process		Inclusion criteria (If the article)	Exclusion criteria (If the article)
1st Round	2nd Round	is a journal paper published OR is a journal article in press OR is a book chapter	is not written in English OR is not published after 1986
		AND is related to value appropriation AND is related to collaboration dynamics	-
		AND is in the field of innovation AND is in the field of network AND its full text is available	OR is an individual study

Because a broad range of related publications included in the databases, we narrowed the publication types to journal papers published or in press and book chapters, in order to eliminate non-academic research (Grégoire, Corbett and McMullen, 2011). Moreover, we excluded publications not written in English to enable effective synthesis, following Crossan and Apaydin (2010) and Yang *et al.* (2017). During the first round, we also removed publications not published after 1986, when Teece (1986) unpacked the “black box” of appropriability in his remarkable work and thus boosting discussions of appropriability in the following decades.

The second and the third rounds were conducted to filter out irrelevant articles. Particularly, for papers that cannot be decided whether or not relevant to our research in the second round, we marked and further examined their full texts in the third round. The number of records decreases to 1225 after the first round, 165 after the second round and finally 21 after the third round. A backward snowballing – a strategy using references of papers to find more relevant studies (Wohlin, 2014) – was conducted after the third round, enlarging the number of primary studies to 22.

The flow diagram of primary study selection is presented in Figure 2.

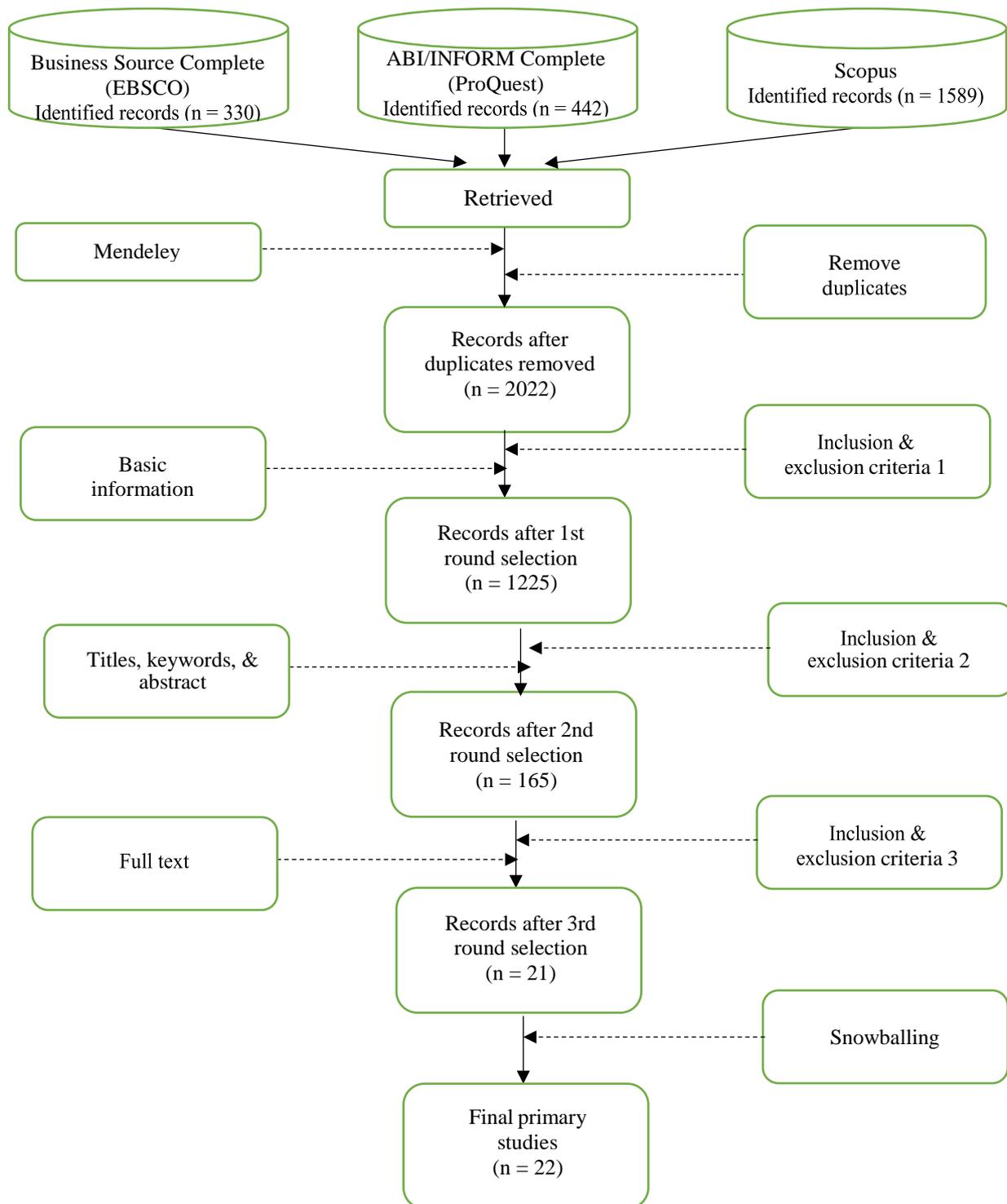


Fig. 2. Primary studies selection.

Source: Adapted from the PRISMA flowchart (see Moher *et al.*, 2009).

Data extraction and synthesis

In addition to the bibliographic datasets stored in Mendeley, we created a personal database in the form of a summary table using Microsoft Excel software, where our final primary studies were tabulated (Pickering and Byrne, 2014; Yang et al., 2017). The summary table contains details of the selected 22 papers and assigns every paper a single row (Pickering and Byrne, 2014). We appraised and ranked the papers based on their quality and relevance to the interests of this research, per Yang et al. (2017). Evaluation considerations include such as: the extent to which the relation between value appropriation and collaboration dynamics was explored, the emphasis on the role of value appropriation in collaboration dynamics, the presence of explanation for collaboration dynamics from the value appropriation perspective, and the robustness of methodology used. Thereafter, we extracted information from every paper and recorded each paper’s research questions, key concepts, methodologies, understandings and explanations about the intersection of collaboration dynamics and value appropriation, gaps and future areas identified by its author(s). A content analysis was conducted on this table, transforming the descriptive information to coded and aggregated constructs (research questions and key concepts remained non-coded) and thus defining categories and sub-categories (cf. Yang *et al.*, 2017). The review results are elaborated and discussed in the following sections.

RESULTS

RELEVANCE OF VALUE APPROPRIATION IN RELATION TO COLLABORATION DYNAMICS

Table 3 presents a cross-tabulation between how the extracted network studies treat appropriability from the relevance aspect and the publication years of them. As shown in Table 3, half of the studies discuss value appropriation separately and treat it as the central issue in collaboration dynamics, while 6 studies (27%) discuss value appropriation as part of value network where value creation is also embedded. Other studies treat value appropriation as a factor influencing decision making (Beauchamp-Akatova and Curran, 2013) and interactions of actors (Andreoni, Frattini and Prodi, 2016), encouraging collaboration (Jarvenpaa and Wernick, 2011; Castro, 2015) and influenced by Open Innovation (Ghezzi, Balocco and Rangone, 2016).

Table 3
Value appropriation relevance and publication years.

	1986– 1990	1991– 1995	1996– 2000	2001– 2005	2006– 2010	2011– 2015	2016– current	Total	%
Central issue					5	4	2	11	50%
A factor									
• influencing decision making						1		1	5%
• influencing interactions of actors							1	1	4.5%*
• encouraging collaboration						2		2	9%
• Influenced by Open Innovation							1	1	4.5%*
Together with value creation embedded in value network					1	2	3	6	27%
Total					6	9	7	22	100%

Note: *4.5% rather than 5% is written here to keep the total calculated as 100%.

Overall, a recently started and an upward trend of including value appropriation perspective in discussions of collaboration dynamics, can be perceived. In addition, top two journals where the extracted studies published are *Industrial Marketing Management* (including the work of Möller and Rajala in 2007: value network; and the work of Chou and Zolkiewski in 2017: central issue) and *Scandinavian Journal of Management* (including the work of Gebauer, Paiola and Edvardsson in 2012: value network; and the work of Ritala and Tidström, in 2014: central issue).

We also investigated the research methods used to examine value appropriation in collaboration dynamics. A breakdown of the research methods is presented in Table 4, cross-tabulated with value appropriation relevance in the studies. A majority of studies reviewed (14 of 22) have preferred a qualitative methodology, especially case study method (13 of 14). This observation accords with viewpoints of Ritala and Tidström (2014) and Chou and Zolkiewski (2017), that value appropriation is an implicit issue that needs exploratory research. However, there is a number of studies (5 of 22) with no empirical examination, but these studies provide conceptual guidelines for future research.

Table 4
Methods used to examine value appropriation in collaboration dynamics

	Quantitative		Qualitative		Mixed	No empirical examination
	Field study		Case study			
	Longitudinal		Longitudinal	Not Longitudinal		
Central issue			3	3	1	4
A factor				1		
• influencing decision making					1	
• influencing interactions of actors						
• encouraging collaboration			1	1		
• Influenced by Open Innovation				1		
A part of process				1		
Together with value creation embedded in value network	1		1	2		1
Total	1		5	9	2	5

CONCERNS ABOUT VALUE APPROPRIATION IN RELATION TO COLLABORATION DYNAMICS

The coding for the concerns about value appropriation in relation to collaboration dynamics in the 22 studies is listed in Table 5, like Majchrzak, Jarvenpaa and Bagherzadeh (2015). We clearly distinguish value creation with value appropriation and examine how the studies treat value creation and value appropriation respectively. Value creation is also examined because we intend to explore the full picture of value network and compare how value creation is treated by the studies with value appropriation. Across these studies, we find that value creation and appropriation are acknowledged mainly about their dynamics and their relationships with dynamic collaboration. Therefore, we sub-categorize value creation concerns to “value creation

dynamics as” and “dynamic collaboration for”; and value appropriation concerns to “value appropriation dynamics as” and “dynamic collaboration for”. “Value creation dynamics as” and “value appropriation dynamics as” indicates how the studies treat dynamics in value creation and value appropriation, with consideration of dynamics in collaboration, while “dynamic collaboration for” reveals the respective roles of value creation and value appropriation in collaboration dynamics. We pay additional attention to the critical research gaps identified by the original author(s) related to value appropriation in collaboration dynamics, in order to map the boundary of the current knowledge. As the research gaps also belong to the concerns about value appropriation, we include them under the category of value appropriation, parallel to the other two sub-categories.

Table 5

Extracted information about research questions or purposes and coded concerns about value creation and value appropriation.

Article	Research questions/purposes	Concerns about value creation			Concerns about value appropriation	
		Value creation dynamics as	Dynamic collaboration for	Value appropriation dynamics as	Dynamic collaboration for	Critical research gaps (identified by the original author(s)) related to collaboration dynamics
Andreoni, A., Frattini, F., & Prodi, G. (2016)	How the interaction between business organisations, local governments and various types of local technology intermediaries changes in particular conjunctures, that is, when business organisations shift towards higher-value product segments within the same industry?	<ul style="list-style-type: none"> • Process • Sustainable 	<ul style="list-style-type: none"> • Co-creation of value 	<ul style="list-style-type: none"> • Response to changing environment (i.e. the technology transition) 	<ul style="list-style-type: none"> • Value of knowledge • Risks share/reduction 	<ul style="list-style-type: none"> • Private-public interfaces
Angehrn, A. A., Maxwell, K., Luccini, A. M., & Rajola, F. (2009)	What is the design of CMTube, a system aimed at stimulating and supporting value-adding online interactions among the members of a distributed community of independent higher education professionals using the same learning approach, i.e. a management simulation?	-	<ul style="list-style-type: none"> • Co-creation of value • Value-added 	-	<ul style="list-style-type: none"> • Value of knowledge 	-
Beauchamp-Akatova, E., & Curran, R. (2013)	Provide an approach for modeling system risk management and to develop an integrated framework for simulating decisions on introducing innovations in air transport systems	-	-	-	<ul style="list-style-type: none"> • Benefits increase • Costs share/reduction • Risks share/reduction 	<ul style="list-style-type: none"> • System risks (after implementation of innovations)
Birtchnell, T., Böhme, T., & Gorkin, R. (2017)	How do universities make use of knowledge exchange with other parties to shape society?	-	-	-	<ul style="list-style-type: none"> • Value of knowledge • Benefits increase • Costs share/reduction • Risks share/reduction 	<ul style="list-style-type: none"> • Diverse objectives/expectations management

Carbone, P. (2007)	What are the dynamics and value propositions surrounding open source and what are the non-cost values such as structure, metrics, applicability and transformation challenges?	• Ecosystem	• Co-creation of value	-	• Value of knowledge • Costs share/reduction	• Industry-academia (i.e. Industry-university) interfaces • Openness (especially business of open source)
Castro, L. (2015)	How brokering activities are progressively built and deployed in French clusters to generate a common organization and a negotiated strategy over time, allowing the several actors concerned by their innovation context to converge?	-	• Value-added	-	• Value of knowledge • Benefits increase • Costs share/reduction	• knowledge brokering activities (call for microscopic analysis, e.g. by tracking a small number of innovation projects during their lifecycles)
Chou, H. H., & Zolkiewski, J. (2017)	1. How do the positive and negative interdependencies in one relationship result in tensions and harmonies? 2. How do the tensions/harmonies in one relationship impact on other relationships in the value net? 3. How do the tensions/harmonies in one relationship impact on value creation and appropriation?	• Process • Coopetitive • Interactive • Supported by common knowledge base • Supported by greater market potential that cooperation presents • Hampered by opportunism	• Value-added • Win-win	• Response to changing environment • Hampered by competitive pressures in the relationship	• Value of knowledge • Benefits increase • Costs share/reduction • Risks share/reduction	• Analysis across cases • Analysis across industries • Coopetition (especially interdependencies and the interplay between harmony and tension in coopetitive situations)
de Oliveira, D. T., & Cortimiglia, M. N. (2017)	What is the value co-creation process at play in web-based multisided platforms, as well as the management implications for the firm promoting the value dynamics?	• Process • Sustainable • Ecosystem • Coopetitive • Interactive	• Co-creation of value	• Hampered by value proposition design problems	• Value of knowledge	• Determinants of the fair share of value for each actor • Consequences for the ecosystem of different value capture strategies (including unconscious action)
Garcia-Castro, R., & Aguilera, R. V. (2015)	How each dollar appropriated by one stakeholder has a positive, neutral, or negative effect on the total value created by the firm?	• Interactive	-	• Determined by the stakeholder's bargaining power	-	• Opportunity costs of stakeholders

Gebauer, H., Paiola, M., & Edvardsson, B. (2012)	How does co-evolvement of the dynamic and operational capabilities in small and medium-sized suppliers form pathways for service business development?	<ul style="list-style-type: none"> • Process 	<ul style="list-style-type: none"> • Co-creation of value • Value-added 	-	<ul style="list-style-type: none"> • Costs share/reduction 	<ul style="list-style-type: none"> • Analysis across industries • Empirical studies • MNEs • Supplier-buyer interfaces • System level • Evolution of dynamic capabilities • Diverse objectives/expectations management
Ghezzi, A., Balocco, R., & Rangone, A. (2016)	<p>1. How do OI (Open Innovation) initiatives in the Mobile Telecommunications industry influence the Business Strategy of Mobile actors?</p> <p>2. How can the OI–Strategy nexus be systematized and organized around recurring central themes?</p> <p>3. Which are the key managerial issues stemming from the OI–Strategy nexus?</p>	<ul style="list-style-type: none"> • Ecosystem • Hampered by opportunism • Affected by open innovation 	-	<ul style="list-style-type: none"> • Firm's competitive strategy (based on cost vs value advantage) • Affected by open innovation 	<ul style="list-style-type: none"> • Value of knowledge • Maintaining/Achieving competitive advantage • Benefits increase • Costs share/reduction 	<ul style="list-style-type: none"> • Analysis across industries • Diverse objectives/expectations management • Openness (especially Strategic Management) • Competition
Hermann, R. R., & Wigger, K. (2017)	How do eco-innovation drivers shape processes in value-creating networks?	<ul style="list-style-type: none"> • Ecosystem • Supported by greater market potential that cooperation presents 	<ul style="list-style-type: none"> • Co-creation of value 	<ul style="list-style-type: none"> • Response to changing environment 	<ul style="list-style-type: none"> • Value of knowledge • Costs share/reduction • Risks share/reduction 	-
Hsieh, P. F., Lee, C. S., & Ho, J. C. (2012)	Why do firms network and cluster together to create value in service?	<ul style="list-style-type: none"> • Process • Strategic networking • Interactive 	<ul style="list-style-type: none"> • Co-creation of value • Value-added 	<ul style="list-style-type: none"> • Response to changing environment • Choice of appropriation mechanisms 	<ul style="list-style-type: none"> • Value of knowledge • Maintaining/Achieving competitive advantage • Benefits increase • Costs share/reduction 	<ul style="list-style-type: none"> • Analysis across industries • Service cluster (especially perceived benefits inside and outside, effects of locating inside, issues of spatial dimension and scale of service clusters, institutional endowments) • Empirical studies • Knowledge spillover (especially effects of

Jarvenpaa, S. L., & Wernick, A. (2011)	1. What tensions are present in open innovation networks? 2. How are they managed?	<ul style="list-style-type: none"> Supported by common knowledge base Hampered by opportunism 	<ul style="list-style-type: none"> Co-creation of value 	<ul style="list-style-type: none"> Affected by open innovation 	<ul style="list-style-type: none"> Value of knowledge Risks share/reduction 	<ul style="list-style-type: none"> geographical and technological distance) MNEs (as hub firms) Openness (especially collaboration in the open innovation networks at the late stage) Analysis across industries (different industry domains of the networks) Diverse objectives/expectations management (e.g. cultural context) Design of alliance portfolios
Lavie, D. (2009)	How companies capture value from their alliance portfolios?	-	<ul style="list-style-type: none"> Affected by open innovation 	<ul style="list-style-type: none"> Firm's competitive strategy (based on cost vs value advantage) Affected by open innovation Determined by the stakeholder's bargaining power 	<ul style="list-style-type: none"> Value of knowledge Maintaining/Achieving competitive advantage Benefits increase Costs share/reduction Risks share/reduction 	
Möller, K., & Rajala, A. (2007)	How to classify the great variety of business nets, as the classification solution would then influence what kind of management mechanisms can be identified or postulated for each net type?	<ul style="list-style-type: none"> Strategic networking Coopetitive Supported by greater market potential that cooperation presents 	<ul style="list-style-type: none"> Co-creation of value Value-added 	<ul style="list-style-type: none"> Firm's competitive strategy (based on cost vs value advantage) 	<ul style="list-style-type: none"> Value of knowledge Maintaining/Achieving competitive advantage Benefits increase Costs share/reduction Risks share/reduction 	<ul style="list-style-type: none"> Empirical studies Performance assessment of business/innovation nets Dynamics of business nets
Murphy, J. T., & Schindler, S. (2009)	1. How two different or discontinuous kinds of production networks in the wood	<ul style="list-style-type: none"> Process Strategic networking 	-	-	<ul style="list-style-type: none"> Value of knowledge Benefits increase Risks share/reduction 	<ul style="list-style-type: none"> Knowledge brokering activities (strategies

	<p>industry—those serving high-volume buyers such as leading transnational corporations (TNC) and those serving low-volume international buyers—create particular value-creation, enhancement and capture opportunities?</p> <p>2. Whether engagements between foreign firms and these different networks can drive ‘globalized’ regional development in a country lacking the institutions and scale, scope and localization economies associated with successful ‘couplings’ between regions and GPN?</p>	<ul style="list-style-type: none"> • Interactive • Supported by greater market potential that cooperation presents 				<p>associated with brokerage networks)</p> <ul style="list-style-type: none"> • Diverse objectives/expectations management (especially global production networks)
Pagani, M. (2013)	How the dynamic cycle of value creation and value capture points in digitally enabled networks in response to triggers related to technology and business strategy?	<ul style="list-style-type: none"> • Ecosystem • Interactive • Supported by greater market potential that cooperation presents 	<ul style="list-style-type: none"> • Value-added 	<ul style="list-style-type: none"> • Firm's competitive strategy (based on cost vs value advantage) • Determined by the stakeholder's bargaining power 	<ul style="list-style-type: none"> • Maintaining/Achieving competitive advantage • Costs share/reduction 	-
Pellikka, J., & Ali-Vehmas, T. (2016)	What are the key differences between business strategy formulations based on a single company and innovation ecosystem perspective?	<ul style="list-style-type: none"> • Ecosystem • Strategic networking • Interactive • Supported by greater market potential that cooperation presents 	<ul style="list-style-type: none"> • Co-creation of value • Value-added 	-	<ul style="list-style-type: none"> • Value of knowledge • Maintaining/Achieving competitive advantage • Benefits increase 	<ul style="list-style-type: none"> • Digitalization impact on strategy (e.g. online communities) • Consequences for the ecosystem of different value capture strategies (including unconscious action) • Dynamics of business nets
Pérez, L., & Cambra-	How asymmetry and identifies under what circumstances	<ul style="list-style-type: none"> • Process 	-	<ul style="list-style-type: none"> • Determined by the 	<ul style="list-style-type: none"> • Value of knowledge 	<ul style="list-style-type: none"> • Design of alliance portfolios (asymmetric relationships)

Fierro, J. J. (2015)	imbalanced relationships can create and distribute value fruitfully?	<ul style="list-style-type: none"> • Strategic networking • Interactive • Supported by greater market potential that cooperation presents 		stakeholder's bargaining power	<ul style="list-style-type: none"> • Maintaining/Achieving competitive advantage • Benefits increase • Costs share/reduction 	
Ritala, P., & Tidström, A. (2014).	How is value created and appropriated in a coopetitive network, and how does this differ in the firm- and relational-level strategies of participating actors?	<ul style="list-style-type: none"> • Process • Strategic networking • Coopetitive • Interactive • Supported by greater market potential that cooperation presents • Hampered by opportunism • Ecosystem 	• value-added	• Firm's competitive strategy (based on cost vs value advantage)	<ul style="list-style-type: none"> • Value of knowledge • Benefits increase • Costs share/reduction • Risks share/reduction 	<ul style="list-style-type: none"> • Different levels of analysis (firm, dyadic relationship between two partners, broader network of multiple partners, business ecosystem, etc.). • Analysis across industries • Competition
Tee, R., & Gawer, A. (2009)	What factors and processes drive value appropriation and value creation in interdependent industry ecosystems?		-	<ul style="list-style-type: none"> • Affected by industry architectures • Determined by the stakeholder's bargaining power 	-	<ul style="list-style-type: none"> • Design of alliance portfolios (e.g. structure of value chains, micro-level situations) • The extent that industry architecture (influence both value creation and appr) could be strategically manipulated • Value migrates across and is appropriated at different parts of the value chain

The key review findings – concerns about value appropriation in relation to collaboration dynamics in the studies, are summarized and reported quantitatively in Table 6. Interpretations incorporated with discussions of all findings, along with future avenues, are given in the next section.

Table 6

Quantitative summary of concerns about value appropriation in relation to collaboration dynamics (ranked by frequency).

Concerns about value appropriation in relation to collaboration dynamics	No. of Studies	%
<i>Value appropriation dynamics as</i>		
Firm's competitive strategy (based on cost vs value advantage)	5	23%
Determined by the stakeholder's bargaining power	5	23%
Response to changing environment	4	18%
Affected by open innovation	3	14%
Hampered by competitive pressures in the relationship	1	5%
Hampered by value proposition design problems	1	5%
Choice of appropriation mechanisms	1	5%
Affected by industry architectures	1	5%
<i>Dynamic collaboration for</i>		
Value of knowledge	17	77%
Costs share/reduction	13	59%
Benefits increase	12	55%
Risks share/reduction	11	50%
Maintaining/Achieving competitive advantage	8	36%
<i>Research gaps identified more than once in the literature</i>		
Analysis across industries	6	27%
Diverse objectives/expectations management	5	23%
Openness	3	14%
Empirical studies	3	14%
Design of alliance portfolios	3	14%
Coopetition	3	14%
Consequences for the ecosystem of different value capture strategies (including unconscious action)	2	9%
MNEs	2	9%
Dynamics of business nets	2	9%
Knowledge brokering activities	2	9%

DISCUSSIONS AND CONCLUSIONS

This research is the first study, to our knowledge, to systematically review and track the existing knowledge on the intersection of collaboration dynamics and value appropriation. In summary, the trajectory of researches related to this intersection is characterized by the recent emergence, the lack of value appropriation specific investigation and theoretical articulations as well as frameworks; the dearth of empirical, quantitative, and across-industry examinations; and the preponderance of value of knowledge in affecting dynamic collaboration.

So far, research on value appropriability and appropriation from inter-firm collaboration point of view has examined a variety of firm-external and firm-internal factors that influence a firm's ability to capture value. First, it has been found that the resource endowments of partners within the network can impact a firm's share of the collectively generated benefits (e.g., Lavie, 2007). Towards the firm's competitive strategy, a firm is dynamically collaborating with actors to form optimal alliance portfolios for the benefits considerations (Lavie, 2009; Chou and Zolkiewski, 2017). Accordingly, some research questions for future research can be "how to design alliance portfolios?", "what are the consequences of different alliance portfolios?", and "how different alliance portfolios affect value appropriation?". More research questions can be related to the leverage of collaboration, for example "how to leverage collaboration for approaching goals as well as appropriating value?" (Jap, 2001).

Second, previous research suggests that the network structure in terms of its density influences the distribution of value among individual partners (e.g., Bae and Gargiulo, 2004). Also in general, network structure and network centrality have been associated with a wide variety of potential firm-level benefits (Ahuja, Soda and Zaheer, 2012), such as performance (Powell, Koput and Smith-Doerr, 1996; Lavie, 2007) and innovative outputs (Schilling and Phelps, 2007). It is in line with the review finding that actors conducting dynamic collaboration are for benefits increase. However, it remains largely unexplored about how collaboration dynamics affect value appropriation resulting from network structure changes. Furthermore, specific benefits and value at different levels (e.g. firm, dyadic relationship between two partners, broader network of multiple partners, business ecosystem, etc.) are worth being explored deeper and more systematically (Ritala and Tidström, 2014). Specifically, process interactions between value appropriation and collaboration within different network structures have potential to be studied.

Third, a firm's ability to bargain over the collective outputs either ex post (e.g., Lavie, 2007) or ex ante (e.g., Adegbesan and Higgins, 2010) determines to some extent the value appropriation by individual firms. For firms, appropriating value is like a "bargaining game" between partners (Lavie, 2007; Gans and Ryall, 2017). A paradox is that while collaborative relationships can facilitate value creation, the main contributors of the joint value creation may restrict the appropriation capacity of and thus undermine the market performance of other participants (Lavie, 2007; Wagner, Eggert and Lindemann, 2010). The appropriation dynamics become more complex as diverse actors with different value appropriation expectations (i.e. expectations on the amount of value they can capture) are networked, and as open innovation phenomenon is included into consideration. Question about how to manage diverse objectives and expectations is naturally raised by researchers (Murphy and Schindler, 2009; Jarvenpaa and Wernick, 2011; Gebauer, Paiola and Edvardsson, 2012; Ghezzi, Balocco and Rangone, 2016; Birtchnell, Böhme and Gorkin, 2017). It corresponds to a potential future avenue – multi-

actor network orchestration (see Dhanaraj and Parkhe, 2006). Potential research questions concerning value appropriation can be such as “how does appropriation emerge in multi-actor networks?”, “how different actors approach their goals through collaboration in a networked environment?” “what drives and what destroys the collaboration of different actors from the perspective of appropriation?”. Ecosystem approach that calls for the lowest level of control and coordinates by enabling (i.e. orchestration) (Chang, Chou and Ramakrishnan, 2009; Ritala, Hurmelinna-Laukkanen and Nätti, 2012) are worth considering to be used. If parameters that affect value appropriated by different actors and their effects can be empirically identified, value capture theory can be advanced greatly (Chatain and Mindruta, 2017; Gans and Ryall, 2017).

Two considerations in particular continue to deserve further examination. First, we suspect that in innovation collaborations, ex-ante identification of collective value and distribution of it (i.e., determining the pie-splitting control rights; Adegbesan and Higgins, 2010) might be nearly impossible as such innovation environments might require firms to share their intellectual property for free. Second, recent studies have proposed that firms selectively reveal their knowledge (Alexy, George and Salter, 2013; Henkel, Schöberl and Alexy, 2014) and intentions (Jarvenpaa and Välikangas, 2014) to reshape the behavior of other actors in networks. The latter notion brings ‘agency’ to our attention. In general, recent research on agency in social structures claims that actors are not merely constrained reproducers by the social structure: they purposefully and deliberately seek to create structures that favor their self-interests (Emirbayer and Mische, 1998). For example, in network structures, behavior and activities can be driven by the expected actor-level payoffs, which generates dynamics and change as a result of different tensions. The expected individual benefits, in turn, originate from actor-specific goals (Bogers *et al.*, 2017). These notions indicate that appropriability building is a balancing act that requires different capabilities to attract other actors to work in line with organization’s goals (cf. Mitrega *et al.*, 2012; Hurmelinna-Laukkanen and Nätti, 2017), and to extract value from jointly created outputs.

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