

Inter-organisational Collaboration in Circular Economy Ecosystems

Anni Paavilainen¹, Anna Heikkinen² and Johanna Kujala³

ABSTRACT

Resource depletion, environmental degradation and waste issues are some of the most pressing sustainability challenges of our time. These problems are largely caused by the linear economy and its so-called take-make-dispose model in which resources are wasted. A circular economy (CE) is presented as a problem-solving alternative to the linear model. The transition to a CE requires systemic cooperation and inter-organisational collaboration. Business ecosystems have recently been suggested as platforms that facilitate collaboration, but the value creation aspect of collaboration remains largely unresearched. This qualitative case study combines the two research streams of inter-organisational collaboration and stakeholder theory to analyse value creation in stakeholder relationships in inter-organisational collaboration. The empirical data were collected by interviewing seven representatives of CE ecosystems and three informants from CE expert companies in Finland in 2019–2020 and by conducting a qualitative content analysis.

Dilemma/questions: The purpose of this study is to examine how inter-organisational collaboration can foster a CE. More precisely, we analyse value creation in stakeholder relationships in inter-organisational collaboration in the context of CE ecosystems.

Theory: The study builds on the literature stream of inter-organisational collaboration and supplements it with relational stakeholder theory, which highlights joint interests, collaboration and trust in the interactions between and amongst organisations and their stakeholders.

Basis of the case: Phenomenon; inter-organisational collaboration

Type of the case: Research case

Protagonist: Not needed

Findings: Our findings indicate that inter-organisational collaboration has the potential to create four types of value for stakeholders in CE ecosystems. These are associational, transactional, interactional and synergistic value, which can all foster the transition to a CE in different ways. We also found that value creation depends on the quality of attributes of the stakeholder relationships included in the process, the maturity of the relationship and/or ecosystem and the engagement of stakeholders in value creation.

Discussions: The study has two main conclusions. First, we propose that the stronger and the more mature stakeholder relationships are in terms of the trust, the ability to collaborate and joint interests, the broader the scale of created value

¹ Tampere University, Finland, Email: anni.paavilainen@tuni.fi

² Tampere University, Finland, Email: anna.l.heikkinen@tuni.fi

³ Tampere University, Finland, Email: johanna.kujala@tuni.fi

in CE ecosystems. Second, we propose that inter-organisational collaboration in CE ecosystems can play a key role in facilitating the transition to a CE. The study contributes to research on inter-organisational collaboration and CE by bringing together the literature streams of inter-organisational collaboration and stakeholder relationships to analyse value creation. The study suggests that further investigation could focus on examining and extending the framework on value creation in inter-organisational stakeholder collaboration proposed in this study with empirical case studies from various industry and geographical contexts.

Keywords: Circular economy, ecosystems, inter-organisational collaboration, stakeholder theory, stakeholder relationships

INTRODUCTION

The current linear economic model is unsustainable, as it follows a take–make–dispose logic (Stahel, 2016). Moreover, it has become disagreeable, as inefficient resource use puts considerable strain on the environment (Ghisellini et al., 2016). A circular economy (CE) has been proposed as a solution to global sustainability problems, such as the tension between planetary boundaries and continuous economic growth (Ellen Mac Arthur Foundation, 2012; Ghisellini et al., 2016; Konietzko et al., 2020; Stahel, 2016). Contrary to the linear model, a CE seeks a more resource-efficient economic system by closing material and energy loops (Bocken et al., 2016; Geissdoerfer et al., 2017) without wasting any resources (Nylén, 2019). A commonly used definition of a CE is ‘an industrial system that is restorative and regenerative by intention and design’ (Ellen MacArthur Foundation, 2012, p. 7). However, this concept is not yet well established or agreed on, and research on it remains scant (Geissdoerfer et al., 2017; Shipilov & Gawer, 2020, p. 93).

Whilst a CE helps tackle sustainability challenges, it also increases inter-organisational dependencies. In turn, increased inter-organisational dependencies escalate the need for collaboration and coordination of actions across organisational boundaries (Aarikka-Stenroos & Ritala, 2017; Muegge, 2013; Valkokari, 2015). However, organisational structures remain siloed both between and within companies (Stahel, 2016), as dividing responsibilities and tasks amongst different organisational functions has been an efficient way to organise business in the current linear economy. To cross the silos and change the current ways of operating, the CE literature emphasises the role of inter-organisational collaboration (Bocken et al., 2018; Ghisellini et al., 2016; Konietzko et al., 2020). Implementing a CE in business requires stakeholder management (Frishammar & Parida, 2019; Ranta et al., 2018), stakeholder collaboration (Bocken et al., 2016; Ünal et al., 2019) and re-thinking value creation (Lüdeke-Freund et al., 2019). The value creation potential of a CE has been recognised (Geissdoerfer et al., 2017; Veleva & Bodkin, 2018), but the concrete actions leading to a transition to a CE remain unclear (de Jesus & Mendonça, 2018, p. 75; Frishammar & Parida, 2019).

The purpose of this study is to examine how inter-organisational collaboration can foster a CE. More precisely, we analyse value creation in stakeholder relationships in inter-organisational collaboration in the context of CE ecosystems. The business ecosystem view provides a holistic perspective of a CE, and several business ecosystems have emerged to create value in a CE. The business ecosystem view fosters systems thinking and supports the wide collaboration possibilities required in a CE (Bocken et al., 2016; Frishammar & Parida, 2019, 7; Ranta et al., 2018). Moreover,

inter-organisational collaboration is essential in business ecosystems (Shipilov & Gawer, 2020), and so are value creation and stakeholder collaboration, in particular (Adner, 2017).

The rest of this article is organised as follows. First, we give an introduction to inter-organisational collaboration and stakeholder theory and propose a theoretical framework on value creation in inter-organisational stakeholder collaboration. By combining these two literature streams, our study responds to calls for more research on inter-organisational collaboration in business ecosystems (Kapoor, 2013) and how value is created in inter-organisational collaboration (Pennec & Raufflet, 2018). Second, we use the proposed framework in a multiple case study focusing on five CE ecosystems in Finland. Whilst these ecosystems focus on different fields, they all aim to facilitate the transition to a CE. The empirical data consist of interviews with ten representatives of Finnish CE ecosystems. Third, the data are analysed with qualitative content analysis, and our findings are presented. Finally, a discussion on the findings and contributions as well as directions for future research are given to conclude the article.

THEORETICAL FRAMEWORK

The literature on inter-organisational collaboration has focused extensively on the motivations (Melander, 2017) and success factors of collaboration (Gray & Stites, 2013). Inter-organisational collaboration is a way to jointly solve complex societal problems (Austin & Seitanidi, 2012; Gray & Stites, 2013) and increase sustainability in companies (Nuhoff-Isakhanya et al., 2016). Although value creation is a central motive for engaging in inter-organisational collaboration, there is a research gap in understanding the nature and processes of value creation (Pennec & Raufflet, 2018).

Stakeholder theory, however, has studied value creation from many perspectives (Tapaninaho & Kujala, 2019), as one of the theory's main arguments is the importance of value creation with and for stakeholders (Freeman, 2010). Recently, stakeholder theory has also been applied to examine stakeholders' interests in the transition towards a sustainable CE (Kujala et al., 2019b). In this study, we follow a network approach to stakeholder theory, in which the focus is on both firms–stakeholder and stakeholder–stakeholder relationships (Frooman, 1999).

The theoretical framework of this study (Figure 1) is based on the Stakeholder Value Creation (SVC) model by Kujala et al. (2019a) and the pyramid of value creation in inter-organisational collaborations by Pennec and Raufflet (2018), which is based on the work of Austin and Seitanidi (2012). The SVC model allows us to examine *the process of value creation*, and the pyramid of value creation explicates *the type of value created* in stakeholder relationships in CE ecosystems.

In Figure 1, the outer circle follows the SVC model, describing three attributes of value-creating stakeholder relationships: joint interests, ability to collaborate and trust, which are significant when a value is created with and for stakeholders (Kujala et al., 2019a). Here, stakeholders refer to individual actors and organisations that can affect or can be affected by firms' operations (Freeman, 1984). According to Kujala et al. (2019a), stakeholders themselves define what is valuable to them, whereas Pennec and Raufflet (2018) have classified four types of value created in inter-organisational collaboration, which are described in the inner circles of Figure 1.

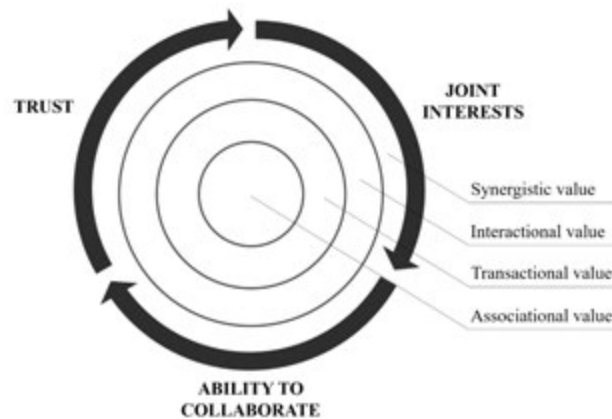


Figure 1. Framework for value creation in inter-organisational stakeholder collaboration
(cf. Kujala et al., 2019a; Pennec & Raufflet, 2018)

According to Pennec and Raufflet (2018), the different types of value are built hierarchically starting from associational value, moving to the transactional and interactional values and, finally, possibly resulting in synergistic value. The process is not linear but rather a continuum (Pennec & Raufflet, 2018). Associational value refers to the benefits of simply engaging in collaboration, such as credibility, visibility and support from the collaborating parties. Transactional value includes benefits that are obtained from assets exchanged with parties, such as the importance and use of the received assets. Interactional value is intangible, for instance, developing capabilities, creating knowledge and learning. It is formed in interactions between the parties. Finally, synergistic value emerges from all the previous values combined, as the collaborating actors accomplish something that would not have been possible without collaboration and input from all of them. This type of value is driven by innovation, and it can occur as an improvement in processes, possibilities to change behaviour and process or product innovations (Pennec & Raufflet, 2018).

The attributes of value-creating stakeholder relationships are joint interests, the ability to collaborate and trust. Joint interests form the basis of the collaboration and development of stakeholder relationships. It does not require all goals to be similar but that parties expect the value to be created in collaboration and are willing to invest in it. The ability to collaborate is an essential basic attribute of all relationships, and it is based on shared views about the importance of information sharing and interaction. The ability to collaborate means that an organisation may pursue its own goals whilst contributing to joint interests (Kujala et al., 2019a). The last attribute, trust, 'is both an element of the relationship and an outcome of successful interaction and collaboration' (Kujala et al., 2019a, p. 134). Trust is an essential attribute that builds resilience in the relationships and engages stakeholders in the process of joint value creation (Kujala et al., 2019a).

MULTIPLE CASE STUDY

Our multiple case study focuses on five CE ecosystems in Finland, which all aim at increasing

circularity by finding and implementing CE solutions. In all these ecosystems, the collaboration between several stakeholders, such as companies, research organisations, non-government organisations and public organisations, is vital. In the life cycle of a CE ecosystem, the ecosystem is formed, and the stakeholders are brought together. Depending on the type of ecosystem, different stakeholders are needed to complement one another's skills and resources. In collaboration, the stakeholders bring their knowledge and skills to the ecosystem and together create and implement CE solutions.

The five CE ecosystems examined in this study have different areas of focus—one of the ecosystems focuses on nutrient cycles, three are built on different material cycles and one consists of a CE business area. In addition, these ecosystems are at different stages of their lifespan—two ecosystems are at their very early stages, two are at a more mature stage and one has been officially finished after fulfilling its purpose. Examining these types of CE ecosystems allows us to better understand value creation in CE ecosystems, as choosing only one ecosystem could leave out some types of processes of value creation occurring in other types or stages of ecosystems.

Table 1: Studied ecosystems and their focus

Ecosystem	Focus	Stage	Location
1	Material cycle	Early	Distant
2	Material cycle	Early	Distant
3	Material cycle	Mature	Distant
4	Nutrient cycle	Finished	Distant
5	Business region	Mature	Local

The examined CE ecosystems are mainly motivated by bringing together different stakeholders to design and implement the transition towards a CE and create value together. In the examined CE ecosystems, typically, one actor operates as a coordinator or an orchestrator of the ecosystem, bringing other stakeholders together and facilitating their work. However, the ecosystems operate differently; one is regional and the other four are brought together in workshops, meetings and remote collaboration without geographical proximity. Although four of the ecosystems do not exist physically as a business area, the importance of face-to-face meetings of CE ecosystem stakeholders is highlighted in all the studied ecosystems.

DATA COLLECTION AND ANALYSIS

We chose to use a qualitative case study approach for our study, as it allows the examination of complex issues in an accessible format whilst producing holistic knowledge of the phenomenon (Eriksson & Kovalainen, 2008). Moreover, our case study is extensive, as it aims to add to previous knowledge by looking for similarities and differences across several cases (Eriksson & Koistinen, 2005). An extensive case study aims at finding common patterns that overlap several cases (Eriksson & Kovalainen, 2008). Here, the five ecosystems represent the cases.

To support the research objective, we collected empirical data using personal in-depth interviews and analysed the data with qualitative content analysis (Eriksson & Kovalainen, 2008).

The interviews were conducted between November 2019 and January 2020, and the interview data amounted to a total of 9 hours 31 minutes. Altogether, ten informants from nine different organisations representing CE expert companies, CE ecosystem coordinators and CE ecosystem participant companies were interviewed.

The research data were analysed with qualitative content analysis, which is a common method for systematically organising and analysing empirical data (Eriksson & Koistinen, 2005). As is typical of an extensive case study, there was a continuous dialogue and interaction between theory and empirical data during the analysis process (Eriksson & Kovalainen, 2008). First, the data were organised through an inductive coding and classifying process. Second, the theoretical framework was formed, and a second-order analysis (Gioia et al., 2013) was conducted with the support of the concepts and ideas included in the theoretical framework. Based on that, the findings were interpreted and discussed.

FINDINGS

In our analysis, we examined how inter-organisational collaboration can foster a CE, and we focused on value creation in stakeholder relationships in inter-organisational collaboration. We found that all four types of value included in our theoretical framework, namely associational, transactional, interactional and synergistic value, were created. Moreover, the attributes of stakeholder relationships, i.e. joint interests, trust and the ability to collaborate, played a key role in defining the type of value created and for which stakeholders it was created. The quality of attributes of the relationships and/or ecosystems, as well as the effort put into the collaboration, were central in defining value creation. In the following, we present our findings in more detail.

ASSOCIATIONAL VALUE

Associational value refers to the benefits of engaging in collaboration. The associational value created in CE ecosystems was often related to the positive atmosphere created by collaboration. It also included the support of other stakeholders within the ecosystem in any problems or issues that were raised. Increased visibility to external parties, such as external stakeholders or decision-makers, was also an essential associational value created in ecosystem collaboration. The following interview responses describe the associational value created in CE ecosystems:

‘If the network has a shared message to officials or decision-makers, together, it is a lot stronger than a lone message’.

‘Our ecosystem is known in the field; I believe that belonging to the ecosystem creates value for the actors’.

‘It also helps to know that others are struggling with the same issues and solving the same problems’.

The associational value was primarily created jointly by all stakeholders involved in an ecosystem. However, the more important the collaboration was for a stakeholder or an individual, the more associational value the collaboration seemed to create. An important basis was the joint interests of collaborating stakeholders, such as the goals to find solutions for fostering a CE or

solving sustainability problems. The joint interests led to participation in an ecosystem. On the contrary, the ability to collaborate or the role of trust was not yet emphasised, although it also formed a critical base for ecosystems to develop further. Hence, we suggest that associational value can be created before strong collaboration and trust are established between stakeholders.

TRANSACTIONAL VALUE

Transactional value, ensuing from exchanging assets, included sharing various resources and skills between the stakeholders. Knowledge sharing between stakeholders was particularly essential and created value both for the ecosystem stakeholders and for the ecosystem as a whole. Access to raw materials or the side flows provided by other stakeholders within the ecosystem were vital in many CE ecosystems. In addition, the connections made in the ecosystem enabled the stakeholders to find new markets and customers and to close deals. Cost savings resulting from joint investments and purchases were also classified as transactional value. The following interview responses describe the transactional values created in CE ecosystems:

‘The actors get support from the ecosystem in testing, quality tests and different kinds of pilots’.

‘Our side-flow materials can be used by manufacturers which belong to the ecosystem—this kind of linkage is created in the ecosystem, which is really good’.

‘We update the companies about current topics which benefit them, whether related to legislation, business, financing and so on’.

‘We share the best practices and contacts with one another’.

The role of trust and the ability to collaborate seemed to be prerequisites for creating transactional value. Sharing resources and knowledge, for instance, required honesty, openness and trust amongst the collaborating stakeholders. Communication and dialogue were highlighted and facilitated by the ecosystem coordinator to understand the needs of the collaborating stakeholders. The transactional value was mostly created amongst those stakeholders that contributed to the collaboration. For instance, open discussions, which led to the identification of a shared problem, could result in sharing resources, creating value for one or more stakeholders. However, creating transactional value was possible even if the stakeholders were not very open or did not put much effort into the collaboration. For instance, the ecosystem coordinator can provide all ecosystem participants with important information that has transactional value. Thus, creating transactional value does not necessarily require a high level of openness or trust between stakeholders and the coordinator.

INTERACTIONAL VALUE

Interactional value refers to benefits created in mutual interactions. In the studied cases, it was based on joint activities and the interaction of stakeholders and resulted in value co-creation. Interactional value included, for example, joint research and development activities, creating new concepts, testing circular business models and solving business or operation-related problems in collaboration with other stakeholders. In addition, the collaboration facilitated opportunities

for new circular businesses and helped pilot new solutions. The following interview responses describe support and co-creation as interactional values in CE ecosystems:

‘The process from the waste to the finished product has so many phases and different functions that nobody can implement them alone, not even two actors together, but an open atmosphere of co-creation needs to be built between several actors’.

‘Had we done this [building material cycles] alone, we would definitely not have gotten this far’.

Creating interactional value required from stakeholders an increasing amount of trust, joint interests and the ability to collaborate. The ecosystem coordinator played a key role in motivating stakeholders to collaborate, connecting them and facilitating the further development of trust and a shared understanding amongst the stakeholders. Commitment and perseverance were required from the stakeholders to create interactional value, as it takes time and effort to build trust and value-creating relationships within a CE ecosystem.

SYNERGISTIC VALUE

Synergistic value requires the previous types of values to be created before the synergistic value could be realised. Synergistic value primarily included increased system-level and cross-industry understanding. It also included designing and implementing complex circular solutions, such as building and advancing markets for circular products, building and developing a CE business area and jointly creating new value chains and material or nutrient cycles. Fostering CE and reaching the ecosystems’ common goals in solving major challenges and problems together, such as slowing down climate change or protecting the environment, were also classified as synergistic value created or expected to be created in CE ecosystems. This synergistic value created or expected is evident in the following interview responses:

‘The key point of this ecosystem thinking is that if a single actor tries to recycle nutrients, it is not likely to succeed in the best way. That’s why the whole value chain needs to be brought together to make it happen’.

‘In order to solve this material challenge, it’s important to bring these different actors to the same table to think and discuss this problem and find out what should be done’.

‘Building such a circular model is something totally new in Europe and in the world’.

Creating synergistic value requires strong trust, widely shared interests and a good collaboration ability from stakeholders. These attributes seem to develop in time as CE ecosystem operations continue and develop. The stakeholders contributing to synergistic value creation seem to share a visionary or ambitious view of a CE or a strong view of the importance of sustainability. This view can help stakeholders commit to pursuing common goals and putting extra effort into their work and into helping others. Additionally, the stakeholders’ abilities to collaborate and the efforts made for the collaboration seemed high. For instance, the ability to openly share relevant information instead of protecting it as a trade secret was essential, and so was investing time and other resources in the collaboration. The interviewees called for open modes of operation so that an honest dialogue becomes a reality in ecosystems and real problems can be solved together.

Lastly, strong trust between the stakeholders was required to openly share information and discuss the most essential problems.

DISCUSSION

The main contribution of this study is to take the idea of value creation in the inter-organisational collaboration further. While value creation is a central motive for engaging in inter-organisational collaboration, a research gap in understanding the nature and processes of value creation exists and calls to further examination of value creation in inter-organisational collaboration have been presented (Pennec & Raufflet, 2018). We use the stakeholder theory and its idea of creating value with and for stakeholders (Freeman, 2010) as well as the related stakeholder value creation model (Kujala et al., 2019a) to examine the *process of value creation*. Moreover, we use the pyramid of value creation in inter-organisational collaborations by Pennec and Raufflet (2018) and based on the work of Austin and Seitanidi (2012) to explicate *the type of value created*.

As a result, we present a novel theoretical framework for value creation in inter-organisational stakeholder collaboration consisting of three attributes of value-creating stakeholder relationships: joint interests, ability to collaborate and trust, which are significant when a value is created with and for stakeholders (Kujala et al., 2019a) and four different types of value: associational value, transactional value, interactional value, and synergistic value (Pennec & Raufflet, 2018). This framework adds to the existing value creation and inter-organisational collaboration literature by being dynamic and by paying attention to the process (Makadok et al., 2018).

To empirically examine how inter-organisational collaboration can foster a CE, we conducted a qualitative case study. We interviewed ten informants from nine different organisations representing CE expert companies, CE ecosystem coordinators and CE ecosystem participant companies. By using an empirical, inductive and analytical approach, our study contributes to previous research on CE where such research has been called for (Geissdoerfer et al., 2017; Makadok et al., 2018). Table 2 summarises our empirical findings according to the four types of value created, all of which foster CE in different ways.

Table 2: Value creation in stakeholder relationships in CE ecosystems

	Associational value	Transactional value	Interactional value	Synergistic value
Examples of value created	A positive atmosphere, support, external visibility	Sharing resources, such as knowledge, contacts, skills and raw materials; cost efficiency through joint investments	R&D activities, new concepts, testing of business models, business-related problem solving	Designing and implementing complex CE solutions, increased system-level and cross-industry understanding
Significance of stakeholder relationship attributes	Stakeholders with joint interests brought together	Besides joint interests, an emerging need for trust and the ability to collaborate	A need for joint interests, trust and the ability to collaborate, especially regarding openness and dialogue	Shared interests and ambitious goals, significant efforts in the ability to collaborate, strong trust between stakeholders

Table 2 summarises the four types of value created with examples and describes the significance of stakeholder relationship attributes to each type of value. Regarding associational value, we conclude that the attribute of joint interests is vital as it enables the stakeholders to join an ecosystem and to engage in collaboration with others. To create transactional value, the stakeholder relationships need to include an element of trust as well as the ability to collaborate. According to our findings, these are vital for sharing resources and making joint investments, for instance. Creating interactional value requires, in addition to the previous attributes, openness and dialogue for solving problems and designing and creating new activities and concepts. Synergistic value creation highlights the importance and simultaneous presence of all these attributes.

Basing on our theoretical framework and empirical findings, we make two propositions that contribute to research on inter-organisational collaboration and CE (Bocken et al., 2018; Ghisellini et al., 2016; Konietzko et al., 2020; Pennec & Raufflet, 2018). First, our study indicates that stakeholder relationships in CE ecosystems have the potential to develop to the stage in which creating synergistic value is possible. CE ecosystems provide continuity and development, which may help stakeholder relationships evolve. Moreover, it seems that the further the relationships develop, the more types of value become accessible in stakeholder relationships. We suggest that this depends on the quality of attributes included in the process, the maturity of the relationship and/or ecosystem and the engagement of stakeholders in the value creation process. Therefore, our first proposition is that *the stronger and the more mature the stakeholder relationships are in terms of the trust, the ability to collaborate and joint interests, the broader the scale of created value in CE ecosystems.*

Second, we propose that *inter-organisational collaboration in CE ecosystems can play a key role in facilitating the transition to a CE.* As our empirical data show, inter-organisational collaboration has the potential to create four types of value for stakeholders in CE ecosystems. These four types of value can foster the transition to a CE in different ways. All of them include the critical elements needed in a CE, such as supporting other stakeholders (associational), sharing knowledge and practices (transactional), co-creating new concepts (interactional), and increasing system-level understanding and solving complex problems (synergistic). In our view, especially the synergistic value created in stakeholder relationships has the potential to contribute to CE transition, as the transition requires systemic changes both in the ways of conducting business and in the economy (Ghisellini et al., 2016; Nylén, 2019).

LIMITATIONS AND FUTURE RESEARCH

We have recognised the following limitations in our research, which can affect the applicability of our results. Firstly, the research data are limited to five ecosystems. This data may leave out some features of value creation taking place in different contexts. Secondly, our data are limited to Finnish CE ecosystems although the global transition to a CE requires not just local but also international collaboration. A third limitation relates to the stage of ecosystems, as some are at an earlier stage, where synergistic value has not yet been created. A further examination of more mature ecosystems could reveal whether the expectations of synergistic value will be realised.

Our findings set several directions for future research on value creation in CE ecosystems and stakeholder relationships. The theoretical framework proposed in this study could be further examined and supplemented with empirical studies from different contexts. Additionally, more mature ecosystems could be chosen as the empirical case, to examine the value creation at later phases of the CE ecosystem and stakeholder relationship development. Thirdly, the attributes of stakeholder relationships could be reflected in the ecosystem's attributes to gain more understanding about the interplay between these two complex structures.

CONCLUSION

The focus of this study has been in value creation in CE ecosystems. We have analysed value creation in CE ecosystems with the support of a theoretical framework derived from inter-organisational collaboration literature and stakeholder theory. Our findings suggest that the inter-organisational collaboration in CE ecosystems has potential to create different types of stakeholder value, depending on the quality of attributes included in the process, the maturity of the relationship and/or ecosystem, and the engagement of stakeholders in the value creation process. Therefore, firstly, we propose that the stronger and more mature the stakeholder relationships are regarding trust, ability to collaborate and joint interests, the broader the scale of created value is in CE ecosystems. Secondly, we propose that inter-organisational collaboration in CE ecosystems can play a key role in facilitating the transition to CE. Our study contributes to research on inter-organisational collaboration and CE by furthering the idea of value creation in inter-organisational collaboration in the context of CE ecosystems. We hope to see future research in this promising topic of value creation in CE ecosystems and stakeholder relationships.

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