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Analysis of Strategic Business Ecosystem Role Models for Service-Oriented Value Creation Systems

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Abstract

The way companies create service-oriented value is changing as organizational boundaries blur towards value creation in ecosystems. To position themselves strategically, practitioners need to understand the different roles in service-oriented value creation systems (SOVCS). Still, there is no evidence if existing role models can be applied for SOVCS. This paper analyses the adequacy of existing strategic role models for service-oriented business ecosystems. The suitability of the role models is evaluated using central aspects of the Service-Dominant Logic. We demonstrate that the existing central strategic role models cannot be transferred to a SOVCS and outline the research need for an adequate strategic role model. Scholars will find an overview of existing role models and use the conducted evaluation as a foundation for further service science research. Based on the identified inaccessibility, a comprehensive strategic positioning model can be developed.

Keywords

Business ecosystems; value co-creation; service-dominant logic; value creation system; Service ecosystems

1. Introduction

For decades it is known that companies do not create value in complete isolation, but often operate as part of a network or other collaboration form [1]. This interconnection between companies is favored by the increasing technological possibilities, which result in blurry boundaries between organizations and a more distributed value creation process [2,3]. In this interorganizational collaboration context, specially one value creation system (VCS) archetype: the business ecosystem (BE), gained relevance for practitioners and researchers. The servitization of many industries and the growing interest in BE call for interdisciplinary research combining those research streams [4,5]. In this context, the Service-Dominant Logic (SDL) presents a service-oriented framework to explain the creation of value [6,7].

Although through the development of the service ecosystem concept it was possible to combine the concept of SDL with the BE, to date there is no analysis that evaluates to what extent the different existent role constellations, denominated strategic role models, in BE as an archetype of VCS are adequate to model service-oriented value creation systems. This knowledge gap therefore offers an opportunity to advance in the field of service science, as well as an opportunity for practitioners seeking to position themselves in a service-oriented value creation systems to further develop their understanding of service-oriented role models.

To address this challenge, better the understanding of the value creation process according to the SDL and contribute to the strategic positioning for actors, this paper seeks to answer the following question: How adequate are the existing strategic role models for service-oriented value creation systems?

2. Research Objectives

To answer the research question, our paper assesses the adequacy of the different strategic role models (SRM) by evaluating them based on criteria reflecting the service-oriented value creation process in accordance with the SDL. To achieve this, through a systematic literature review, we first identify groups of roles useful to describe how value creation in BE functions. After presenting the results of the systematic literature review on BE strategic role models, five central aspects derived from the eleven foundational premises from the SDL: a) resource integration, b) the user/customer role, c) service exchange, d) institutions & institutional arrangements and e) service innovation are further analysed. In conclusion, we present the results of the analysis, the insights gained through the evaluation and possible extensions of this paper that could be beneficial to further develop the understanding of SOVCS. As indicated, the focus of this paper is set on BE as a VCS archetype, therefore, from now on when mentioning VCS, reference will be made primarily to BE. Given that the SDL provides a meta-theoretical framework for understanding value creation, the results of the analysis are useful not only for BE, but also for other VCS where complex constellations of actors are present [8].

3. Value creation systems

Using the term "Value creating system" from Parolini (1999) as a reference, this paper introduces the term Value creation system as an overarching term to refer to the models such as cluster, value chain, value network, business ecosystem etc., which, although varying in their approaches, directly or indirectly explain the activities and processes that result in the creation of value [9]. The word system manages to capture the complexity and dynamism of the value creation process, as well as the flow and exchanges between the actors, an aspect that the term network does not manage to encapsulate completely [10]. A Value creation system is therefore a set of actors interacting with each other with different behaviours (cooperation, competition, or co-competition) performing activities with the main goal of creating value, generating monetary profit, and innovating in the process.

In this context, particularly the business ecosystem as an archetype of VCS has grown considerably in recent years; a search for the term ecosystem in the main strategy journals reveals that in the last five years alone, the number of articles has increased sevenfold [11]. Business ecosystems can be defined as an at least partially open structure made up of different interdependent, yet autonomous, actors who coordinate their activities towards a shared purpose to co-create value [12,13]. Unlike other VCS such as clusters or value networks, BE are characterized by the presence of competition and cooperation among the actors, also denominated co-competition, as well as by the co-evolution that takes place thanks to the intensive exchange of information and knowledge among the actors of a business ecosystem [14,15]. In the SDL, SE are seen as self-adjusting, relatively self-contained systems consisting of resource-integrating actors, which are connected through so called shared institutional arrangements as well as mutual value creation through service-exchange [10].

4. Role Models in Business Ecosystems

It is essential to understand that actors in BE adopt roles. These can be described as set of characteristic behaviours and activities carried out by BE actors which serve to specify how they contribute and position themselves in relation to the common created and captured value [8,16].

A thorough comprehension of the different roles, as well as their implications, activities and risks within a BE is necessary for the development of positioning strategies. Doing that, companies are able to identify and achieve a favourable position through the efficient use of resources and capabilities, while simultaneously considering other relevant actors [17].

Since value is co-created among several actors, the individual analysis of roles considering their adequacy to model SOVCS would not be applicable. Therefore, to provide an adequate unit of analysis, the concept of strategic role model (SRM) is introduced as a set or constellation of roles in a VCS, which seeks to explain how value is created, as well as the contribution of each role to the viability and functionality of the system. The need for further research into the different constellations of roles in the value creation process has already been stressed by leading academics in the service science field [18].

4.1 The literature review process

The review of existing relevant literature is fundamental in the academic context and serves as a firm foundation in the advancement of knowledge, closing existing research areas and simultaneously discovering new ones [19]. By integrating different findings and perspectives, the research question is addressed with a higher coverage than individual studies [20]. Considering the need to synthesize relevant literature on SRM, the systematic literature review framework developed by Vom Brocket et al., consisting of five phases (I-V) was used. The framework begins with the (I) definition of the review scope, continues with the (II) conceptualization of topic, which is followed by the (III) literature search, with its contents analysed in the (IV) literature analysis and synthesis phase, to finally develop a (V) research agenda [21].

To delimit the scope of the research, in the initial phase (I) the taxonomy of literature reviews developed by Cooper (1988) was used [22]. In a second phase (II), a coherent structuring of the topic of research was necessary, demanding the adoption of a point of view about the topic, as well as a broad conception of what is known about the topic and potential areas needing knowledge [23].

The third phase (III) according to Vom Brocke et al.'s approach is the literature search, which possesses a funnel form and consists of five stages. Following the recommendations of Antons et al. (2021), Reuters Web of Science and Scopus were used as initial datasets [24]. In addition, IEEE Xplore was used to increase the literary volume of the search. As a result of the search, a total of 2883 publications matching the defined search string were gathered. Since the systematic reviewing process is error prone and time consuming and considering that computational techniques offer to combine human knowledge and judgment with the speed and efficiency of computers, the open-source Tool ASREVIEW was used to accelerate the screening process, thus increasing transparency and efficiency [24–26]. This way, it was possible to reduce the literature to a total of 32 publications. Prior to the final selection, a forward and backward search according to Webster & Watson was conducted [19]. In a final selection stage, the literature was reduced to a total of eleven papers from seven different authors. The decisive factor for the final selection of the literature (n=11) was the presence of a clear differentiation between the roles, as well as the respective role description regarding functions and behavior. Figure 1 shows a summary of the search and selection process.

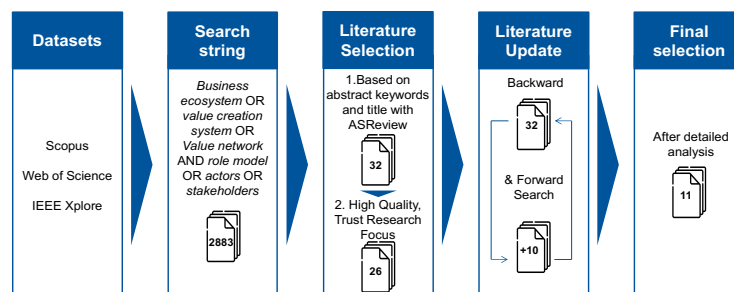


Figure 1-Systematic literature review process

4.2 The literature review results

After having carried out the literature analysis and synthesis (IV) and summarizing seven strategic role models (see Figure 2), recognizing the different roles as well as their functions and characteristics, two relevant conclusions could be drawn (V). The first is, that despite the differing compositions and approaches

of the SRM, certain roles are replicated more often and do not distinguish much in terms of activities and contribution to value co-creation. This applies particularly to the leading role of the VCS, which in general orchestrates the rest of the roles to co-create value and guarantee the survival of the BE.

| Strategic Role Models | Roles | | | |
|--|------------------------------|---|--|-------------------------------------|
| <i>Moore (1993, 1996)</i> | Leader | Follower | Outsider | Customer |
| <i>Iansiti & Levien (2004a, 2004b)</i> | Keystone | Niche Player | Dominator | |
| | | | Physical | Value |
| <i>Adner (2006, 2017)</i> | Leader | Follower | Complementor | Intermediaries |
| <i>Gawer & Cusumano (2008, 2014)</i> | Platform Leader | Complementor | Platform leader-wannabe | |
| <i>Kastalli & Neely (2013)</i> | Architects | Solvers | Constructors | Resources |
| | Hub - Influencer | Scales - Niches Innovators | Connectors and integrators Facilitators - representatives-promoters Infrastructure | Talent & Knowledge Capital |
| <i>Jacobides et al. (2018)</i> | Hub | Complementor | Customer | |
| <i>Dedehayir et al. (2018)</i> | Leadership roles | Direct Value Creation | Value Support | Entrepreneurial |
| | Ecosystem Leader - Dominator | Supplier - Assembler Complementor - User | Expert - Champion | Entrepreneur - Sponsor Regulator |

Figure 2-Summary of the literature review results

In second place, no strategic role model makes specific reference to service or service-oriented value creation. Instead, it is left unclear whether the value arises through service or goods. In general, the term offering is used, or goods and service are bundled together, thereby treating them as if they were similar when it comes to creating value.

As a conclusion, service-oriented value creation is not specified in the different SRM, reaffirming the necessity of the evaluation of these SRM, assessing their adequacy to model SOVCS (V).

5. Analysis of strategic role models

To assess the adequacy of existing strategic role models for SOVCS central aspects of the Service- Dominant Logic are used.

5.1 Criteria development

Service-Dominant Logic emerged in the marketing field in 2004, providing an alternative lens to the Goods-dominant logic (GDL) perspective for understanding the creation of value and exchange between actors. On the one hand, Vargo & Lusch argued that knowledge and skills applied collaboratively among actors in the pursuit of mutual benefit is the source of value, rather than material goods (GDL). On the other hand, this pursuit of mutual benefit, called service-for-service exchange, implied the creation of value among multiple actors, termed co-creation, rather than the creation of value embedded in a good by an individual actor (i.e., a manufacturing firm) subsequently delivered to a consumer (GDL) [27,28]. The viewpoint for continuous transfer, generation and application of knowledge provided by the SDL, is of vital relevance to the practitioners, better enabling them to fulfil their potential [29]. The evolution of the SDL is reflected in the foundational premises (FP), whereby the SDL provides a framework for observing the actors in the exchange process [10]. In summary, through FP, it is conveyed that by means of the interaction in which service is exchanged, as well as through the integration of resources between actors, value is created [30].

As a guideline for the development of the criteria, the following questions were addressed to capture the essence of the SDL and its perspective on value co-creation:

- 1) What are the activities actors carry out in the service-oriented value creation process and how do they behave to co-create service-oriented value?
- 2) How is the service-oriented value co-creation process characterized and which are the prerequisites or optimal conditions for it to take place?
- 3) How do service ecosystems function and what distinguishes them from the original BE as VCS notion?

The following Figures 3 and 4 provide a summary of the criteria a-e, as well as the foundational premises that were used for their development, further explained in the following.

| 11 Foundational Premises | | 5 Axioms | |
|--------------------------|--|----------|--|
| 1 | Service is the fundamental basis of exchange | 1 | |
| 2 | Indirect exchange masks the fundamental basis of exchange | | |
| 3 | Goods are distribution mechanisms for service provision | | |
| 4 | Operant resources are the fundamental source of strategic benefit | | |
| 5 | All economies are service economies | | |
| 6 | Value is cocreated by multiple actors, always including the beneficiary | 2 | |
| 7 | Actors cannot deliver value but can participate in the creation and offering of value propositions | | |
| 8 | A service-oriented view is inherently beneficiary oriented and relational | | |
| 9 | All social and economic actors are resource integrators | 3 | |
| 10 | Value is always uniquely and phenomenologically determined by the beneficiary | 4 | |
| 11 | Value co-creation is coordinated through actor-generated institutions and institutional arrangements | 5 | |

Figure 3-SDL - Foundational premises

| Criteria | Criteria description | FP - Axiom |
|----------|---|------------------------------|
| a | All actors, member of a SOVCS, integrate different kind of resources (knowledge and skills being the most relevant), thus enabling the co-creation of value | FP3 - FP4 - FP6 FP7 - FP9 |
| b | The customer/beneficiary is included in the service-oriented value co-creation process and determines the value; acting as co-creator and not as a consumer. | FP6 - FP8 - FP10 |
| c | The interaction between actors who are members of a SOVCS seek mutual benefit, ruling out parasitism. | FP1 - FP2 - FP8 |
| d | In an SE (SOVCS), rules, norms and standards generated by actors are necessary for the coordination, collaboration, and cooperation in the value co-creation process. | FP2 - FP7 - FP11 |
| e | Service innovation is performed in conjunction with the customer/beneficiary and entails the recombination of existing knowledge. | FP4 - FP6 - FP9 |

Figure 4- Developed service-oriented criteria

a) Resource Integration (FP3, FP4, FP6, FP7, FP9)

In the SDL it is crucial to differentiate between operand and operant and their contribution to service-oriented value creation through their integration and application. Although operant resources (knowledge and skills) are considered the basis of strategic benefit (FP4), this does not diminish the relevance and value of the goods (operand), since these are used for the creation of value acting as intermediaries or vehicles, indirectly providing service (FP3) [31]. Service provision is possible through the integration of resources, which is an ongoing process performed by all actors (FP9) consisting of the combination and utilization of resources, both possible through the application of knowledge and skills [32].

According to the SDL, integrating resources together with other actors is necessary, especially since no single actor has all the resources it needs [29]. This dependence and need to combine and apply resources with other actors is reflected in FP6, which stresses the fact that value creation is interactional and performed by multiple actors (co-creation), with the co-created value resulting from a unique combination of resources [30]. In this context of value co-creation between several actors (FP6) through the integration of both operand and operant resources (FP3, FP4, FP9) seeking to benefit another actor or itself (service), value propositions (FP7) become essential. The latter can be seen as an invitation to co-create value, implying that an actor cannot create, but only co-create value (FP6, FP7) [10].

The FPs addressed explain how value co-creation is inherently collaborative among all members of a SOVCS (FP6, FP7) and resource usage (FP9) of operand and operant resources (FP3, FP4) and their integration is essential for the co-creation of value. All actor's, member of a SOVCS, integrate different kind of resources (knowledge and skills being the most relevant), thus enabling the co-creation of value.

b) The customer/beneficiary role (FP6, FP8, FP 10)

For this second criterion, a role mentioned several times in the conducted systematic literature review, the customer or, as it is called in the SDL, the beneficiary is highlighted.

Building on and being directly associated with FP6, where the interactional nature of service-oriented value co-creation was highlighted, FP10 highlights the integrative and key role of the beneficiary (i.e. customer)

in all instances of value co-creation, being the actor who determines the value and consequently mandatorily being part of its creation process [10,33]. For this reason, the beneficiary is always part of the value co-creation process (FP6) and according to SDL, a service-oriented point of view is inherently beneficiary-oriented (FP8). To distance itself from the inadequate GDL, the SDL developed a lexicon of its own. This was also reflected in the rejection of the term consumer, since in the value creation context, consuming would imply the use of the value until there is no more of it left and its consequent destruction [10,32].

The customer/beneficiary is central as, depending on the context and use, the value is determined by him/her, being obligatorily part of the value co-creation process and discarding the value consumption, which is rather reminiscent of a Goods-Dominant Logic. The customer/beneficiary is included in the value co-creation process and determines the value, acting as co-creator and not as a consumer.

c) Service Exchange (FP1, FP2, FP8)

This third criterion c focuses on the interaction between the actors within a SOVCS, addressing all three guiding questions, as well as one of the central core processes in the SDL, namely service-exchange.

Vargo & Lusch (2004) defined service as the application of operant (knowledge and skills) resources to benefit oneself or another entity [34]. Building on this definition of service, the first two FP explain how service is basically always exchanged for service (FP1), and how this service exchange often goes on unnoticed as the exchange sometimes involves complex combinations of resources, as well as operand resources (i.e. money as an intermediary in service exchange) (FP2) [30].

On the other hand, through FP8, already mentioned in the previous criterion, seeking once again to distance itself from the GDL in which the customer is exogenous to the creation of value, the SDL stresses the need for a relationship or multiple relationships for the co-creation of value as well as for the exchange of service. Furthermore, the wording beneficiary oriented of FP8 refers to the definition of service, in which activities are not performed for the customer/beneficiary, but jointly with the latter [10]. This focus on collaboration and good intentions between service providers and beneficiaries in the exchange according to the SDL, drew multiple criticisms from other scholars. Authors such as Plé and Chumpitaz Cáceres (2010) introduced the term value co-destruction, arguing that there are interactions between service systems that result in the decline of one of the parties involved, arguing that resources can harm in a detrimental way other parties despite being used with a good intention and introduce terms such as misuse of resources as well as intentional value co-destruction [35].

Criterion c builds up on this mutualistic perception to describe the co-creation of value through service-exchange between members of a SOVCS. The definition of service in the SDL, as well as the FP considered for this criterion (FP1, FP2, FP8) can be described by using terms and concepts from biology, just like in the BE notion. More precisely with mutualism, in which both actors profit from the interaction or exchange, simultaneously discarding parasitism, in which one is harmed by the exchange while the other benefits [36]. The interaction between actors, members of a SOVCS seek mutual benefit, ruling out parasitism.

d) Institutions & institutional arrangements (FP2, FP7, FP11)

The criterion d arose through the third guiding question. Institutions & institutional arrangements go hand in hand with the service ecosystem (SE) concept. In this criterion, the role of institutions & institutional arrangements in the co-creation of value according to the SDL is outlined. The essential feature of a service ecosystem are the institutions, which are rules, norms, standards, meanings, symbols and practices intended to aid collaboration, as well as institutional arrangements, which are defined as independent assemblies of institutions [33]. These rules, norms and standards enable the exchange of service and can be formalized, e.g., in the form of laws, or exist informally, also called soft or implicit contracts and are generated by actors within the service ecosystem itself [37,10].

Institutions as well as institutional arrangements, are necessary primarily for the coordination, but also for the communication process taking place between actors exchanging service in service ecosystems [10]. Specifically, it is the network effects with their increasing returns, originating when several actors share an institutional arrangement or institution that causes the institutions & institutional arrangements to be critical in achieving an increasing level of service-exchange as well as service-oriented value co-creation [33]. Furthermore, institutions and institutional arrangements can also be regarded as resources actors can draw on [38]. This is of particular interest, given that by integrating these rules, norms and standards, actors in a SOVCS can increase the potential value of their Value propositions (FP7) [29]. In summary, institutions & institutional arrangements act as enablers of coordination, collaboration, as well as cooperation of the actors in the value co-creation process [33]. Focusing on the notion and relevance of institutions and institutional arrangements as coordinating rules, norms, and standards, enabling the creation of value through service-exchange in a Service ecosystem (FP2, FP11), as well as the ability of the actors in a SOVCS to integrate them to their advantage, eventually enhancing their VP as an invitation to co-create value and collaborate (FP7), the criteria addressing the three FP considered can be summarized this way: In an SE (SOVCS), rules, norms and standards generated by actors are necessary for the coordination, collaboration, and cooperation in the value co-creation process.

e) Service Innovation (FP4, FP6, FP9)

Considering the relevance of innovations in the original BE notion and in the definition of VCS, this criterion addresses the concept of innovation from the SDL-perspective. In the SDL, collaboration as well as coordination are essential to innovate and gain competitive advantage, considering for example the employees of a firm as operant resources and a primary basis for innovation (FP4) [39]. It should be noted that innovation, according to the SDL, is closely linked to the integration of resources. Once again, a clarification is made between operand and operant resources. According to the service-oriented innovation, there is no real difference between innovation through tangibles or knowledge and skill (FP3, FP4), since according to the SDL, all product innovations are nothing more than service innovations [39].

Like the value co-creation process, in the service-innovation process, beneficiaries are crucial (FP6). Actors in a SOVCS, as in a VCS with a BE-approach, can adopt different roles. The beneficiary/customer role, already discussed in the criterion c, can assume several roles depending on the service-exchange in the innovation process; among these roles are the ideator and the designer. Beneficiaries taking the role of ideator, are characterized by sharing their knowledge about their needs as well as how they use the existing offerings in the market, thus converting tacit knowledge to explicit; while customers/beneficiaries taking on the designer role, directly mix and match different resources to configure new service [39]. According to the SDL, service innovation consists of bundling different types of resources (FP9), giving rise to the creation of new innovative resources. Presenting big similarities to the criterion a, for this process to be successful operant resources are crucial (FP4), thus being considered the key type of resource for innovation. As outlined, the customer/beneficiary is involved in the process, taking on roles in the collaborative endeavour (i.e., ideator & designer) (FP6). Service innovation is performed in conjunction with the customer/beneficiary and entails the recombination of existing knowledge.

5.2 Evaluation of strategic role models

By means of the analysis conducted it was possible to answer the research question posed in the introduction, demonstrating that a) none of the existing SRM from BE as VCS archetype is completely adequate to model/describe SOVCS and b) each of the SRM manages to fulfil different levels of service-oriented criteria. The results of the qualitative analysis are presented in Figure 5.

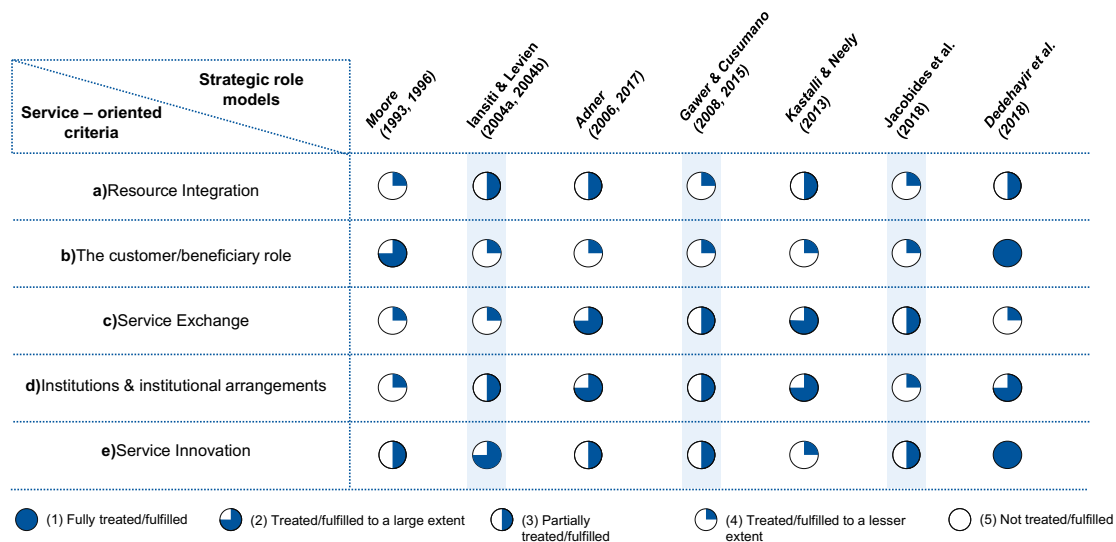


Figure 5-Results of the conducted analysis

6. Conclusion

This paper was intended to analyze the strategic role models (SRM) of value creation systems (VCS) with a business ecosystem (BE) approach, thereby assessing their adequacy to model service-oriented value creation systems (SOVCS).

In the research process, we managed to combine two very comprehensive topics: value creation in business ecosystems and service-oriented value creation, reducing them to a more tangible level of analysis by emphasizing on different SRM of BE and integrating the SDL through the development of five criteria.

Through the literature review, an overview of the different roles that actors can take in a business ecosystem according to seven different scholars was provided, this being useful for researchers studying ecosystems and their roles and for practitioners wanting to be part of an ecosystem or to create one (Fig. 2). Through the evaluation the strategic role models of the different authors, we demonstrated that none of them is completely adequate to explain service-oriented value creation (Fig. 5). We believe that based on the conducted analysis, new strategic positioning models can be developed to help practitioners identify the best fitting role to co-create value along other actors in a SOVCS.

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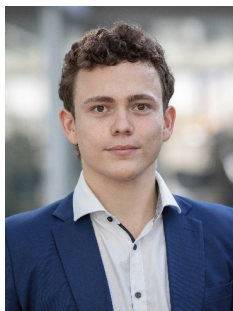
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