Disciplina: TÓPICOS AVANÇADOS EM SERVITIZAÇÃO

Professor Dr. Henrique Rozenfeld

Discentes: Jacqueline de Almeida Barbosa Franco

Meta-informações das revisões bibliográficas (2022)

O artigo de revisão que você irá analisar nem sempre contém informações para todas as metainformações, além das que você pode encontrar na web. Se ele não contiver, digite NADA no tópico correspondente.

As informações podem ser inseridas em inglês, como cópia do original (citar a página)

Salvar este artigo antes de inserir o conteúdo, com o título: SEP5843 2020 - análise revisão <nome do aluno> <ano, autor principal>

1. Referência completa do artigo

Dynamic capabilities for ecosystem orchestration A capability-based framework for smart city innovation initiatives

2. Autores (um registro por autor)
   Lina Linde
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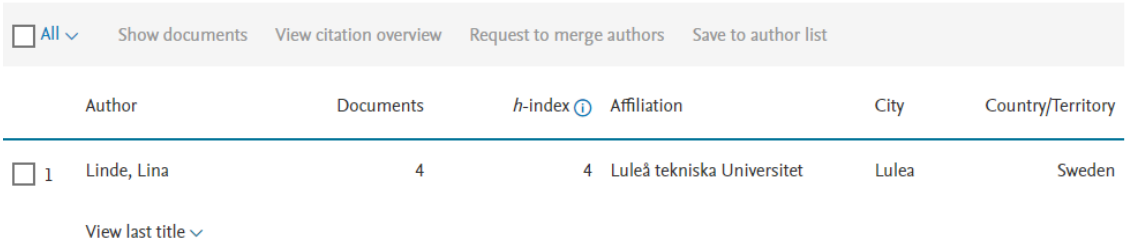
   - Ph.D. candidate in entrepreneurship and innovation (aluna).

   2.2. Idade: NADA
   2.3. Anos pesquisando no assunto: Desde 2014, finalizou o mestrado em 2017, cujo tema foi Designing Revenue Models for Smart, Connected and Integrated Product-Services.
   2.4. Instituição:
   - Luleå University of Technology | LTU · Department of Business Administration, Technology and Social Sciences (ETS)

   2.5. Índice-h: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1	Linde, Lina	4	4	Luleå tekniska Universitet	Lulea	Sweden

View last title

2.6. Colegas da mesma instituição

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Wiebke Reim	Luleå University of Technology
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2.7. Quantidade de artigos já publicados:8 publicações Googleschoolar

2.8. Outros artigos significativos (mais citados) sobre outros temas.
NADA

2.9. Outros artigos significativos (mais citados) neste tema

Artigo	Autores	Journal/Ano	Citações
Dynamic capabilities for ecosystem orchestration A capability-based framework for smart city innovation initiatives	Linde, L., Sjödin, D., Parida, V., Wincent, J.	Technological Forecasting and Social Change, 2021.	27
Revenue Models for Digital Servitization: A Value Capture Framework for Designing, Developing, and Scaling Digital Services	Linde, L., Frishammar, J., Parida, V.	IEEE Transactions on Engineering Management, 2021.	5
Evaluation of Digital Business Model Opportunities: A Framework for Avoiding Digitalization Traps	Linde, L., Sjödin, D., Parida, V., Gebauer, H.	Research Technology Management, 2020.	14
Transforming provider-customer relationships in digital	Kamalaldin, A., Linde, L., Sjödin, D., Parida, V.	2020	58

servitization: A relational view on digitalization			

2.10.Co-autores recorrentes

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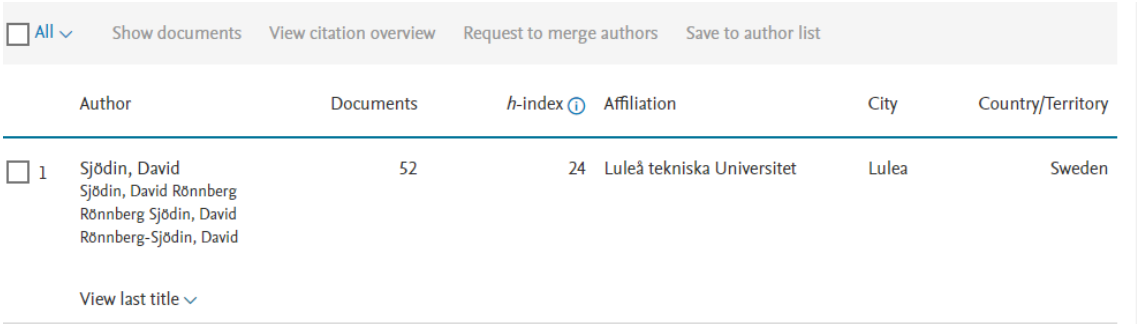

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2.7.Quantidade de artigos já publicados: 64 artigos (Research gate)
2.8.Outros artigos significativos (mais citados) sobre outros temas: NADA
2.9.Outros artigos significativos (mais citados) neste tema

Lista dos 10 artigos mais citados:

Adopting a platform approach in servitization: Leveraging the value of digitalization	Cenamor, J., Rönnberg Sjödin, D., Parida, V.	International Journal of Production Economics, 2017.	201
Open innovation and the stage-gate process: A revised model for new product development	Grönlund, J., Sjödin, D.R., Frishammar, J.	California Management Review, 2010.	172
Reviewing literature on digitalization, business model innovation, and sustainable industry: Past achievements and future promises	Parida, V., Sjödin, D., Reim, W.	Sustainability (Switzerland), 2019.	168
Smart Factory Implementation and Process Innovation: A Preliminary Maturity Model for Leveraging Digitalization in ManufacturingMoving to smart factories presents specific challenges that can be addressed through a structured approach focused on people, processes, and technologies.	Sjödin, D.R., Parida, V., Leksell, M., Petrovic, A.	Research Technology Management, 2018.	128
Mastering the transition to product-service provision: Insights into business models, Learning activities, and capabilities	Parida, V., Sjödin, D.R., Wincent, J., Kohtamäki, M.	Research Technology Management, 2014.	123
Developing global service innovation capabilities: How global manufacturers address the challenges	Parida, V., Sjödin, D.R., Lenka, S., Wincent, J.	Research Technology Management, 2015.	100

of market heterogeneity			
An agile co-creation process for digital servitization: A micro-service innovation approach	Sjödin, D., Parida, V., Kohtamäki, M., Wincent, J.	Journal of Business Research, 2020.	86
Value Creation and Value Capture Alignment in Business Model Innovation: A Process View on Outcome-Based Business Models	Sjödin, D., Parida, V., Jovanovic, M., Visnjic, I.	Journal of Product Innovation Management, 2020.	77
Value co-creation process of integrated product-services: Effect of role ambiguities and relational coping strategies	Rönnberg Sjödin, D., Parida, V., Wincent, J.	Industrial Marketing Management, 2016.	70
Risk management for product-service system operation	Reim, W., Parida, V., Sjödin, D.R.	International Journal of Operations and Production Management, 2016.	66

2.10. Co-autores recorrentes (ResearchGate)

O autor já trabalhou com 150 co-autores, no entanto, os mais recorrentes são:

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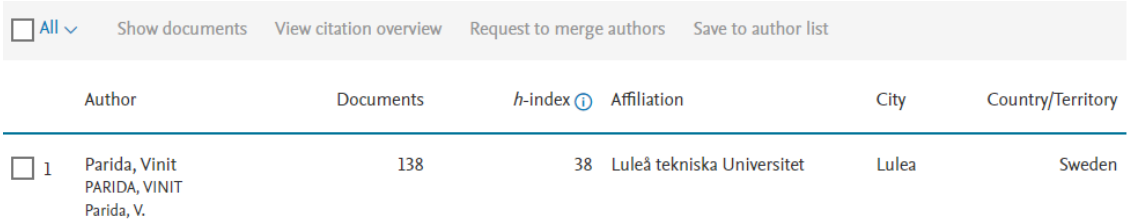

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	Author	Documents	h-index	Affiliation	City	Country/Territory
1	Parida, Vinit PARIDA, VINIT Parida, V.	138	38	Luleå tekniska Universitet	Lulea	Sweden

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2.7.Quantidade de artigos já publicados: 132 artigos publicados

2.8.Outros artigos significativos (mais citados) sobre outros temas: NADA

2.9.Outros artigos significativos (mais citados) neste tema:

Lista dos 10 artigos mais citados:

Inbound Open Innovation Activities in High-Tech SMEs: The Impact on Innovation Performance	Parida, V., Westerberg, M., Frishammar, J.	Journal of Small Business Management, 2012.	452
Product-Service Systems (PSS) business models and tactics - A systematic literature review	Reim, W., Parida, V., Örtqvist, D.	Journal of Cleaner Production, 2015.	436
Too much of a good thing? Absorptive capacity, firm performance, and the moderating role of entrepreneurial orientation	Wales, W.J., Parida, V., Patel, P.C.	Strategic Management Journal, 2013.	206

Adopting a platform approach in servitization: Leveraging the value of digitalization	Cenamor, J., Rönnberg Sjödin, D., Parida, V.	International Journal of Production Economics, 2017.	201
Non-linear relationship between industrial service offering and sales growth: The moderating role of network capabilities	Kohtamäki, M., Partanen, J., Parida, V., Wincent, J.	Industrial Marketing Management, 2013.	185
Digital servitization business models in ecosystems: A theory of the firm	Kohtamäki, M., Parida, V., Oghazi, P., Gebauer, H., Baines, T.	Journal of Business Research	179
Digitalization Capabilities as Enablers of Value Co-Creation in Servitizing Firms	Lenka, S., Parida, V., Wincent, J.	Psychology and Marketing, 2017.	176
Reviewing literature on digitalization, business model innovation, and sustainable industry: Past achievements and future promises	Parida, V., Sjödin, D., Reim, W.	Sustainability (Switzerland), 2019.	168
Nonlinear effects of entrepreneurial orientation on small firm performance: The moderating role of resource orchestration	Wales, W.J., Patel, P.C., Parida, V., Kreiser, P.M.	Strategic Entrepreneurship Journal, 2013.	150
A systematic literature review of entrepreneurial opportunity recognition: insights on influencing factors	Mary George, N., Parida, V., Lahti, T., Wincent, J.	International Entrepreneurship and Management Journal, 2016.	129

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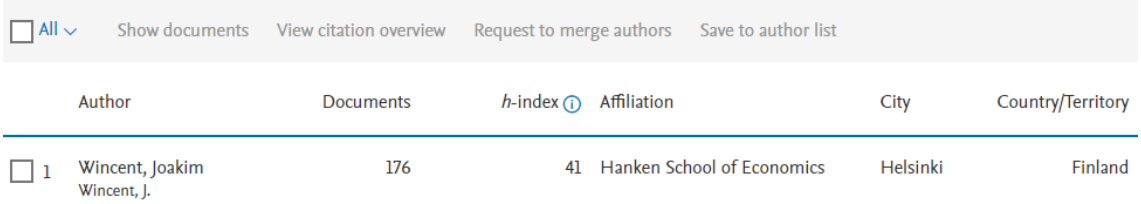

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2.9.Outros artigos significativos (mais citados) neste tema:

Lista dos 10 artigos mais citados:

The nature and experience of entrepreneurial passion	Cardon, M.S., Wincent, J., Singh, J., Drnovsek, M.	Academy of Management Review, 2009.	872
Prominent consequences of role stress: A meta-analytic review	Örtqvist, D., Wincent, J.	International Journal of Stress Management, 2006	202
Non-linear relationship between industrial service offering and sales growth: The moderating role of network capabilities	Kohtamäki, M., Partanen, J., Parida, V., Wincent, J.	Industrial Marketing Management, 2013	185
Co-Opetition dynamics - an outline for further inquiry	Bengtsson, M., Eriksson, J., Wincent, J.	Competitiveness Review, 2010.	183
Digitalization Capabilities as Enablers of Value Co-Creation in Servitizing Firms	Lenka, S., Parida, V., Wincent, J.	Psychology and Marketing, 2017.	176
Entrepreneurial self-efficacy and business start-up: Developing a multi-dimensional definition	Drnovšek, M., Wincent, J., Cardon, M.S.	International Journal of Entrepreneurial Behaviour and Research, 2010.	154
Does network board capital matter? A study of innovative performance in	Wincent, J., Anokhin, S., Örtqvist, D.	Journal of Business Research, 2010.	136

strategic SME networks			
A systematic literature review of entrepreneurial opportunity recognition: insights on influencing factors	Mary George, N., Parida, V., Lahti, T., Wincent, J.	International Entrepreneurship and Management Journal, 2016.	129
Mastering the transition to product-service provision: Insights into business models, Learning activities, and capabilities	Parida, V., Sjödin, D.R., Wincent, J., Kohtamäki, M.	Research Technology Management, 2014.	123
Designing interorganizational networks for innovation: An empirical examination of network configuration, formation and governance	Thorgren, S., Wincent, J., Örtqvist, D.	Journal of Engineering and Technology Management - JET-M, 2009.	115

2.10. Co-autores recorrentes

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Malin Malmstrom	Luleå University of Technology
David Sjödin	Luleå University of Technology
Dean A. Shepherd	University of Notre Dame
Jeaneth Johansson	Luleå University of Technology & Halmstad University
Dietmar Grichnik	University of St.Gallen
Vinit Parida	Luleå University of Technology (Atualmente na University of South-Eastern, Bo, Norway)

3. Estrutura do abstract (contextualização, gap/lacuna, objetivo, metodologia, resultados e conclusão).

Contextualização: Firms are faced with increased dynamism due to rapid technological development, digitalization, and sustainability requirements, creating

novel opportunities for ecosystem innovation. This is particularly prevalent in smart city contexts where initiatives concerning, for example, energy efficient buildings and smart energy grids drive new kinds of ecosystem formation. **Gap/Lacuna:** Orchestrating emerging innovation ecosystems can offer a path to sustained competitive advantage for ecosystem leaders. Yet, it calls for the development of new capabilities to sense, seize, and reconfigure digitalization opportunities in a highly dynamic ecosystem environment. Yet, prior research lacks insights into the dynamic capabilities and routines required for ecosystem innovation. **Objetivo:** Therefore, this study investigates how firms can develop dynamic capabilities to orchestrate ecosystem innovation and, thus, gain from it. **Metodologia:** Through a multiple case study of smart city initiatives, we offer insights into the specific micro-foundations or sub-routines underlying the ecosystem leader's sensing, seizing, and reconfiguring capabilities, which are necessary to orchestrate ecosystem innovation. **Resultados:** We develop a capability-based framework demonstrating three orchestration mechanisms – namely, configuring ecosystem partnerships, value proposition deployment, and governing ecosystem alignment. **Conclusão:** Our findings carry implications for the literature on innovation ecosystems and dynamic capabilities, as well as for managers.

4. Palavras-chaves e se foram citadas no abstract.
   Ecosystem innovation; Dynamic capabilities; Smart cities; Digitalization; Digital servitization

5. Introdução e/ou revisão bibliográfica introdutória, afirmações / constatações (tipo) versus citações (essa lista pode ser longa, por isso coloquei em forma de tabela)

Afirmação / Constatação	Tipo (*1)	Referência (*2)
In the era of digitalization, innovation is a central concept that no longer resides at the micro level within the four walls of a company but rather at the macro level and across a multitude of partnerships called innovation ecosystems	C	(Adner, 2017; Kummitha, 2018).
Originating as a biological metaphor, the term ecosystem generally refers to a group of interacting firms that depend on each other's activities	C	(Adner and Kapoor, 2010; Jacobides et al.,2018).
There is little consensus on how firms can best organize the multitude of partnerships involved in ecosystem innovation.	L	-
Firms need to be more dynamic because rapid technology development, digitalization, and the circular economy are creating increased industry convergence and large-scale industrial transformation.	G	-
Firms across industries are searching for new synergies, partnerships, and collaboration formats that can secure future	C	(Furr and Shipilov, 2018; Kohtamäki et al., 2020; Parida et al., 2019).

competitiveness and profitable business models in an ecosystem setting		
In particular, initiatives on smart and sustainable cities offer ecosystem opportunities for business-model innovation by bringing together multiple diverse actors (e.g., energy and electricity providers, municipalities, construction companies, and citizens) in attempts to increase efficiency through novel multi-actor value propositions.	C	(Appio et al., 2019; Brock et al., 2019; Parida et al., 2019; Sjödin et al., 2020).
However, current knowledge about how ecosystem leaders orchestrate extended ecosystems to profit in dynamic and uncertain environments is not well understood.	L	-
Across industries, we are witnessing numerous new business model initiatives by ecosystem leader, where they are adding digital technologies to physical products to offer so-called 'digital services' (e.g., optimization of energy usage in buildings)	G	(Kohtamäki et al., 2020; Paschou, 2017).
However, orchestrating innovation by leading actors in an ecosystem inherits several challenges.	G	-
For example, orchestrating diverse actors such as municipalities, companies, and citizens (many of whom are new to each other, not having previously created and delivered value jointly), requires the proper alignment of diverse incentives among these new types of actor constellation	G	(Sandulli et al., 2017; Visnjic et al., 2016).
A further complication to the story is the new type of value proposition, such as digital services, tends to be new to the firm and their associated ecosystem.	G	-
Value in an innovation ecosystem, compared to traditional value chains, is created, delivered, and captured differently, and it requires the alignment of activities among a diverse set of partners.	G	(Appio et al., 2019; Jovanovic et al., 2021; Parida et al., 2019).
Ecosystem actors are dependent on each other's core competences to create and deliver value propositions.	G	-
A digital service such as the optimization of energy usage in a building requires firms providing the electricity, heating, and ventilation to work together to deliver the service to the customer.	G	-
A pivotal challenge for ecosystem innovation is that firms are not used effectively manage	G	(Dedehayir et al., 2018; Sklyar et al., 2019).

dynamic and uncertain ecosystem environments due lack established routines and capabilities for organizing ecosystem innovation in the digital era		
However, less is known about the type of capabilities required to remain competitive in these dynamic innovation ecosystem settings.	L	-
Building on the resource-based view and the capability-based view, the literature on dynamic capabilities can provide novel insights into how firms can manage highly dynamic external environments such as ecosystem innovation	J	(Helfat and Peteraf, 2003; Wernerfelt, 1984; Kindström et al., 2013; Lütjen et al., 2019; Shuen et al., 2014).
Based on the idea that unique bundles of resources form the basis of competitive advantage, the dynamic capabilities perspective sees sustainable competitive advantage as the ability to create, extend, and modify valuable resources and capabilities over time	G	(Helfat and Raubitschek, 2018).
Such capabilities are arguably at the core of ecosystem innovation. Yet, insights into the formation and use of dynamic capabilities in an ecosystem context are hitherto lacking.	L	-
First, there is a need for understanding how to develop dynamic capabilities and sub-routines that foster ecosystem innovation.	L	-
We argue that the theoretical lens of dynamic capabilities provides a relatively novel perspective from which to approach ecosystem innovation and build such important insights.	J	-
There is, therefore, a need to understand the "distinct skills, processes, procedures, organizational structures, decision rules, and disciplines" that underly dynamic ecosystem innovation capabilities.	L	(Teece, 2007, p. 1319).
Indeed, few prior studies have investigated dynamic capabilities in an ecosystem context and, so, various gaps exist that need to be addressed.	L	-
There is a need to understand the micro-foundational level of how firms can develop routines to create and deliver new value propositions in collaboration with diverse ecosystem actors.	L	(Felin and Foss, 2012).
Indeed, few prior studies have described key challenges facing ecosystem innovation such	J	(Adner, 2017; Hurmelinna-Laukkanen and Nätti, 2018; Parida et

as aligning incentives, deciding on roles, and formalizing governance mechanisms		al., 2019; Visnjic et al., 2016).
Focusing on dynamic capabilities in an ecosystem-innovation context would provide opportunities for uncovering the productive routines and sub-activities that underly success in ecosystem innovation.	C	-
For example, ecosystem leaders need capabilities that allow them to orchestrate multiple actors and leverage highly dynamic conditions	G	(Parida et al., 2019).
Second, an interesting domain for further inquiry is how ecosystem leaders can use dynamic capabilities for ecosystem orchestration.	L	-
Dynamic capabilities can be disaggregated into three distinct activities: sensing opportunities and threats, seizing those opportunities, and maintaining competitiveness by reconfiguring resources. All three are critical if firms are to remain competitive in a dynamic environment.	G	(Teece, 2007).
However, it would be beneficial to further investigate how ecosystem leader uses these different capabilities in combination for orchestrating relationships with diverse actors.	L	-
Indeed, prior research has shown that distinct configurations of capabilities are required to successfully offer digital services in complex ecosystem	G	(Sjödin et al., 2016).
Extending such logics to the ecosystem-innovation context would provide important opportunities for understanding the basis of competitiveness that is derived from resources and capabilities in ecosystems.	G	-
In recent years, both academia and practitioners have shown an increasing interest in the concept of 'ecosystem' as a new way to depict the competitive environment.	G	-
While the term 'ecosystem' has been deployed in the field of strategy for some time, its applicability has greatly expanded over the last decade.	G	(Dhanaraj and Parkhe, 2006; Iansiti and Levien, 2004; Moore, 1993).
even suggested that "the concept of ecosystem might now substitute for the industry for performing analysis".	G	(Teece, 2016, p. 1).
While similar terms such as networks and alliances are delineated according to actor	G	(Gulati, 1999; Adner, 2017).

ties, the pattern of connectivity for an ecosystem is the value proposition		
Companies in an ecosystem rely on each other's contributions to a higher degree than in traditional value chains where suppliers can more easily be replaced	G	(Porter, 1985; Adner, 2017; Jacobides et al., 2018).
In their literature review of the strategy field, Jacobides et al. (2018) identify three different aspects of an ecosystem that scholars have focused on: business ecosystem, which centers on a firm and its environment; platform ecosystem, which considers how actors organize around a platform; and innovation ecosystem, which focuses on a particular innovation or new value proposition and the constellation of actors that support it.	G	(Jacobides et al., 2018).
As with innovation ecosystems, smart city initiatives often require multiple (both existing and new) actors to come together and collaborate for a new innovative value proposition to take shape	G	(Appio et al., 2019; Schaffers et al., 2011).
An innovation ecosystem can be defined as the "alignment structure of the multilateral set of partners that need to interact in order for a focal value proposition to materialize"	G	(Adner, 2017, p. 42).
This perspective considers the interdependence amongst ecosystem actors as value is created; it starts with a value proposition and seeks to identify the activities and set of actors that need to interact in order for the proposition to materialize.	G	(Adner and Kapoor, 2010).
The aim of smart city initiatives can be seen as "improv[ing] urban performance by using data, information and information technologies (IT) to provide more efficient services to citizens, to monitor and optimize existing infrastructure, to increase collaboration amongst different economic actors and to encourage innovative business models in both the private and public sectors"	C	(Marsal-Llacuna et al., 2015, p. 618).
Smart city initiatives involve significant ecosystem innovation activities as diverse actors collaborate to create novel value propositions so that the sustainability of cities is improved	G	(Ahvenniemi et al., 2017; Appio et al., 2019).
Smart cities strive to increase the competitiveness of local communities through innovation while increasing the	G	(Appio et al., 2019; Kumar et al., 2020).

sustainability and quality of life for its citizens through better public services and a cleaner environment		
To achieve this, smart cities rely on innovation ecosystems leveraging state-of-the-art information technology (e.g., sensors and connected devices, open data analytics, and fiber-optic networks), as well as human capital (e.g., universities, companies, and public institutions). However, these ecosystems do not evolve on their own	G	(Angelidou, 2014; Appio et al., 2019; Hurmelinna-Laukkanen and Nätti, 2018).
An essential and distinguishing feature of an ecosystem is the presence of a central actor, who sets the system-level goal, defines the hierarchical differentiation of members' roles, and establishes standards and interfaces	G	(Adner, 2017; Gulati et al., 2012; Teece, 2016).
This leading role in the ecosystem goes under many different labels; for example, orchestrator, architect, keystone player, or simply ecosystem leader	G	(Hurmelinna-Laukkanen and Nätti, 2018; Gulati et al., 2012; Bosch-Sijtsema and Bosch, 2015; Iansiti and Levien, 2004; Adner, 2017; Dedehayir et al., 2018).
In the context of smart cities, the leader is the central actor providing more efficient services, encouraging the use of data and information technologies, and promoting increased value co-creation amongst different economic actors	G	(Sjödin, 2019; Parida et al., 2019; Sklyar et al., 2019).
The purpose is to encourage new business models in order to transform the smart city concept, and to maintain it.	G	-
To orchestrate a smart city as an innovative ecosystem, the ecosystem leader needs to possess orchestration capabilities	G	(Adner, 2017; Hurmelinna-Laukkanen and Nätti, 2018; Walrave et al., 2018).
That means skills in forging and sustaining partnerships, managing technology infrastructure, governing the ecosystem, and managing value-creation and value-capture activities. Innovation ecosystem orchestration as "the set of deliberate, purposeful actions undertaken by a focal organization for initiating and managing innovation processes in order to exploit marketplace opportunities".	G	(Ginsberg et al., 2010; Li and Garnsey, 2013; Adner and Kapoor, 2010; Almirall et al., 2014; Gawer and Cusumano, 2014; Adner, 2017; Visnjic et al., 2016; Kapoor and Lee, 2013; Ritala et al., 2013; Verhoeven and Maritz, 2012, p. 5).
Prior studies acknowledge that orchestration is a dynamic activity, which is "a set of	G	(Hurmelinna-Laukkanen and Nätti, 2018; Mitrega

evolving actions, not static structural position"		and Pfajfar, 2015; Teece, 2020; Paquin and Howard-Grenville, 2013, p. 1624).
To drive smart city initiatives, there is a need for central actors to address opportunities and threats and mobilize ecosystem efforts around those opportunities by reconfiguring resources.	G	-
Thus, the ecosystem leader needs skills and capabilities to orchestrate an innovative ecosystem – these are reminiscent of the dynamic capabilities discussed in prior literature but on a more aggregated level.	G	-
How can firms remain competitive over time in an era of increased environmental dynamism? The answer that leading scholars have given is 'dynamic capabilities'	C	(Eisenhardt and Martin, 2000; Kindström et al., 2013; Teece et al., 1997).
The dynamic-capability perspective has its roots in the resource-based view	G	(Barney, 1991; Schumpeter, 1934).
Whereas the resource-based view considers a firm's competitiveness through the resources and capabilities a firm already possesses, the dynamic-capabilities perspective focuses on how firms can adapt to changing environments by reconfiguring their resources and capabilities	G	(Eisenhardt and Martin, 2000).
While the dynamic-capabilities perspective has been criticized for tautologic reasoning and for being non-operational, it has, nevertheless, become a cornerstone in the field of strategic management over the last two decades because it provides insights into a very important competitive concern.	G	(Priem and Butler, 2001; Williamson, 1999; Eisenhardt and Martin, 2000; Teece et al., 1997).
The underlying concept of dynamic capabilities can be defined as "the firm's processes that use resources – specifically the process to integrate, reconfigure, gain, and release resources – to match and even create market change.	C	-
"Dynamic capabilities are the organizational and strategic routines by which firms achieve new resource configurations as markets emerge, collide, split, evolve, and die."	C	(Eisenhardt and Martin, 2000, p. 1107).
Research has acknowledged that, "when we observe a dynamic capability in use, we are observing the underlying processes"	G	(Helfat et al., 2009, p. 31).
Such processes include R&D, technology and/or knowledge transfer routines, alliance	G	(Eisenhardt and Martin, 2000; Teece, 2007).

and acquisition capabilities, and resource allocation routines		
Dynamic capabilities incorporate the capacity to identify a need or an opportunity for change, formulate a response to such a need or opportunity, and implement a course of action	G	(Helfat, et al., 2009).
Teece states that, for analytical purposes, "dynamic capabilities can be disaggregated into the capacity to 1) sense and shape opportunities and threats, 2) to seize opportunities, and 3) to maintain competitiveness through enhancing, combining, protecting, and, when necessary, reconfiguring the business enterprise's intangible and tangible assets."	G	(2007, p. 1319).
Sensing capabilities is essentially about gathering relevant market intelligence. That involves being aware of the business environment and understanding markets and (potential) customers, competitors, and other ecosystem partners – in essence, identifying business opportunities	G	(Teece, 2007).
These capabilities involve scanning, interpreting, learning, and creating activities, and are critical in developing innovative value propositions.	G	(Teece, 2007).
The firm must constantly search, scan, and explore the full gamut of markets and technologies to identify opportunities and threats, and to understand latent demand	G	(Helfat et al., 2009).
Seizing capabilities is about disseminating market intelligence; that is to say, addressing the identified business opportunity through an innovative value proposition	G	(Teece, 2007).
In an ecosystem, actors make use of each other's capabilities to address an identified opportunity and deliver the value proposition	G	(Teece, 2020).
In other words, complementarity in capabilities is essential for an innovation ecosystem and, often, it is the ecosystem leader who is responsible for orchestrating the resource flow	G	(Dedehayir et al., 2018; Hurmelinna-Laukkanen and Nätti, 2018).
Reconfiguring capabilities has to do with staying competitive over time by adapting resources and structures to changing environments	G	(Teece, 2007).
In an ecosystem, this can be a complex task because actors depend on each other's capacity to fully adapt. Thus, the ecosystem	G	(Kindström et al., 2013; Teece, 2007).

leader has not only to safeguard its own internal reconfiguring activities but also those of the ecosystem partners		
We acknowledge that dynamic capabilities exist in smart cities and, as they enable innovation ecosystems to continuously adapt and stay relevant, they become a source of sustained competitive advantage in rapidly changing, competitive, and innovation-intense markets	C	(Eisenhardt and Martin, 2000; Kindström et al., 2013).
The field of dynamic capabilities provides a relatively new perspective from which to approach ecosystem innovation in general, and the smart city context in particular.	C	-
So far, very few scholars have linked dynamic capabilities to ecosystem innovation.	G	-
One emerging stream is exploring the role of dynamic capabilities in managing ecosystems for service innovation	G	(Lütjen et al. 2019; Nenonen et al., 2018).
For example, in their study of the energy utility sector, identify twelve ecosystem-related capabilities needed for service innovation in product-centric firms.	G	(Lütjen et al., 2019).
Other scholars have focused on dynamic capabilities in more specific contexts.	G	-
How dynamic capabilities can guide universities in managing their innovation ecosystem, consisting of industrial actors, and local and national governments.	G	(Heaton et al., 2019).
A few studies have focused on different aspects of dynamic capabilities for ecosystem leaders.	G	-
On the role of dynamic capabilities in helping start-ups to develop into ecosystem leaders, designing an evolutionary framework for the start-up process.	G	(Feng et al., 2019).
Potential of dynamic capabilities to increase value creation and capture for digital platform leaders and argued that innovation capabilities, environmental scanning and sensing capabilities, and integrative capabilities for ecosystem orchestration are critical for ecosystem leaders.	G	(Helfat and Raubitschek, 2018).
These studies illustrate the relevance of dynamic capabilities in an ecosystem-innovation context driven by digitalization.	G	-
However, we still lack insights into the composition and underlying routines that	G	-

enable dynamic capabilities in an ecosystem-innovation context.		
In particular, sensing, seizing, and reconfiguring capabilities are arguably all required for firms to remain competitive over time and to find ways of applying diverse capabilities together.	G	-
Yet, few studies have investigated their interdependence in reaching innovation outcomes.	G	-
New insights are required to understand dynamic ecosystem capabilities, the process of value creation from these dynamic capabilities, and the way in which the orchestration of ecosystems can facilitate a more comprehensive appreciation of how firms can best develop dynamic capabilities to profit from ecosystem innovation in smart city contexts.	J	-

(*1) Tipos de afirmação / constatação: G (geral), C (contexto), J (justifica o artigo / pesquisa), L (**explicita a lacuna**). A constatação da lacuna é muito importante. Mas é difícil diferenciar J de L.; (*2) Inserir somente autor(es) e ano. A referência completa encontra-se no próprio artigo

6. Casos citados e principais características dos casos:
   Our case study is built on data from 49 interviews from four ecosystems in the smart city context, where initiatives have been taken on smarter and more sustainable buildings and energy solutions. We have interviewed ecosystem leaders as well as customers, partners, and other suppliers participating in different ecosystems. The findings indicate that dynamic capabilities and, more specifically, sensing, seizing, and reconfiguring capabilities are crucial for ecosystem leaders to orchestrate the ecosystem and achieve ecosystem innovation in the long term.

7. Questão da pesquisa, Foco (escopo) e Objetivos (geral primário e secundários):
   Questão de pesquisa:
   How can companies organize business processes to be able to continuously create and profit from ecosystem innovation?
   How do different dynamic capabilities work together and what are the underlining orchestration mechanisms?
   Foco (escopo):
   We focus on how dynamic capabilities can support firms to be competitive in an era of digitalization and increasing ecosystem innovation.
   Objetivos (geral primário e secundários):
   Specifically, the purpose of this study is to investigate how firms can develop dynamic capabilities to orchestrate ecosystem innovation.

8. Caso seja uma survey sobre o assunto: qual o diferencial deste artigo (análise da revisão) com relação a outras revisões e/ou surveys? (segundo o autor, caso ele

tenha citado). Avaliar cada um dos diferenciais separadamente, caso o autor tenha feito isso. Pode montar uma tabela se for o caso.
NÃO, O estudo trata-se de estudo de casos múltiplos.

9. Metodologia

9.1. Descrição Geral: Nome do(s) método(s); se é qualitativo, quantitativo ou combinação de ambos:

Abordagem: qualitativa / Estudo de casos múltiplos / pesquisa qualitativa.

9.2. Fontes (referências) utilizadas sobre os métodos científicos adotados. Pode montar uma tabela: método x fonte.

Pesquisa Qualitativa	(Eisenhardt e Graebner, 2007; Yin, 2018)
Estudo de casos múltiplos (04 ecossistemas de inovação)	(Eisenhardt e Graebner, 2007; Yin, 2018)
Entrevistas semiestruturadas	Yin, 2018
Triangulação de dados	Jick (1979)

9.3. Período de análise das referências (publicações desde que ano):

Foram utilizadas referencias clássicas como Schumpeter (1934) e Porter (1985) até publicações recentes como Teece (2020); Thomson et al. (2021) e Jovanovic et al. (2021).

- SCHUMPETER, Joseph A. The theory of economic development, translated by Redvers Opie. Harvard: Economic Studies, v. 46, n. 1600, p. 0404, 1934.

- TEECE, David J. et al. Hand in glove: Open innovation and the dynamic capabilities framework. Strategic Management Review, v. 1, n. 2, p. 233-253, 2020.

- THOMSON, Linus et al. A maturity framework for autonomous solutions in manufacturing firms: The interplay of technology, ecosystem, and business model. International Entrepreneurship and Management Journal, v. 18, n. 1, p. 125-152, 2022.

- JOVANOVIC, Marin; SJÖDIN, David; PARIDA, Vinit. Co-evolution of platform architecture, platform services, and platform governance: Expanding the platform value of industrial digital platforms. Technovation, p. 102218, 2021.

9.4. Tamanho da amostra analisada: 04 Estudos de casos.

9.5. Quantidade de referências citadas: References (72).

9.6. Foram realizadas observações complementares? NADA

9.7. Fontes da revisão (casos, periódicos específicos, e quais bases de dados). Quais as justificativas para escolher essas fontes.

To help us understand how firms orchestrate ecosystem innovation, we adopted Teece's (2007) division of dynamic capabilities – i.e., sensing, seizing, and reconfiguring – as

synthesizing concepts to create the three overarching themes: ecosystem sensing capabilities, ecosystem seizing capabilities, and ecosystem reconfiguring capabilities.

9.8. Estratégia para construção da string de busca: NADA

9.9.String de busca: NADA

9.10.Filtro

The cases were selected on the basis of three criteria. First, the case had to involve an innovation ecosystem; that is to say, multiple actors collaborating to offer a value proposition to the market. Furthermore, the case had to provide access to the ecosystem leader, a customer, and at least two other ecosystem actors (e.g., sub-supplier, technical provider, municipality). Second, the innovation ecosystem should be pursuing a smart city initiative, and the value proposition must be enabled through a digital technology – for instance, a digital platform to store, monitor, and optimize energy distribution. Third, all cases had to have an overarching goal to achieve sustainability benefits with their smart city initiatives; for example, to become more energy and resource efficient.

9.11.Técnica / método de análise utilizada

Análise temática	(Braun e Clarke, 2006; Cenamor et al., 2017).
Codificação temática	Braun e Clarke (2006)
Análise software MAXQDA (versão 2018.1)	-

9.12.Metodologia para definição de pesquisas futuras

Quantitative studies that investigate how dynamic capabilities at the level of the firm influence performance based on moderating variables such as ecosystem relationships, digitalization maturity, and other factors would add to the limited knowledge on what factors drive sustainability performance in a smart city context.

10. Resultados

10.1.Quantidades resultantes antes e após cada filtro: NADA

10.2.Definições (resultantes da análise ou mesmo adotadas como premissas no início da publicação): NADA

10.3.Evolução da pesquisa / das publicações no assunto:

The field of dynamic capabilities provides a relatively new perspective from which to approach ecosystem innovation in general, and the smart city context in particular. So far, very few scholars have linked dynamic capabilities to ecosystem innovation. One emerging stream is exploring the role of dynamic capabilities in managing ecosystems for service innovation (Lütjen et al. 2019; Nenonen et al., 2018). For example, in their study of the energy utility sector, Lütjen et al. (2019) identify twelve ecosystem-related capabilities needed for service innovation in product-centric firms. Other scholars have focused on dynamic capabilities in more specific contexts. For example, Heaton et al. (2019) studied how dynamic capabilities can guide universities in managing their innovation ecosystem, consisting of industrial actors, and local and national governments. A few studies have focused on different aspects of dynamic capabilities for ecosystem leaders. Feng et al. (2019), for example, focused on

the role of dynamic capabilities in helping start-ups to develop into ecosystem leaders, designing an evolutionary framework for the start-up process. Helfat and Raubitschek (2018) studied the potential of dynamic capabilities to increase value creation and capture for digital platform leaders and argued that innovation capabilities, environmental scanning and sensing capabilities, and integrative capabilities for ecosystem orchestration are critical for ecosystem leaders. These studies illustrate the relevance of dynamic capabilities in an ecosystem-innovation context driven by digitalization. However, we still lack insights into the composition and underlying routines that enable dynamic capabilities in an ecosystem-innovation context. In particular, sensing, seizing, and reconfiguring capabilities are arguably all required for firms to remain competitive over time and to find ways of applying diverse capabilities together. Yet, few studies have investigated their interdependence in reaching innovation outcomes.

10.4. Comunidades / "tribos" / "igrejas" / áreas de conhecimento / disciplinas identificadas: (Servitization / Servitisation) / Inovation Ecosystem / Bussiness Model / Dynamic capabilities

10.5. Características de cada tribo (os atributos e/ou explicações são definidos pelo próprio artigo):

Innovation Ecosystem: An innovation ecosystem can be defined as the "alignment structure of the multilateral set of partners that need to interact in order for a focal value proposition to materialize" (Adner, 2017, p. 42).

Smart city initiatives: Can be seen as "improv[ing] urban performance by using data, information and information technologies (IT) to provide more efficient services to citizens, to monitor and optimize existing infrastructure, to increase collaboration amongst different economic actors and to encourage innovative business models in both the private and public sectors" (Marsal-Llacuna et al., 2015, p. 618).

Bussiness models: The purpose is to encourage new business models in order to transform the smart city concept, and to maintain it. (Adner, 2017; Hurmelinna-Laukkanen and Nätti, 2018; Walrave et al., 2018).

Dynamic Capabilities: "the firm's processes that use resources – specifically the process to integrate, reconfigure, gain, and release resources – to match and even create market change. Thus, "dynamic capabilities are the organizational and strategic routines by which firms achieve new resource configurations as markets emerge, collide, split, evolve, and die." (Eisenhardt and Martin, 2000, p. 1107; Teece, p. 1319).

10.6. Principais "achados" (*findings*)

We find that ecosystem innovation is highly dependent on continuous adaptation to the evolving nature of customer needs, emerging technologies, and new entrants. Thus, having processes and routines that enable an adaptable organization to handle new market needs and requirements is necessary for innovativeness and long-term competitiveness. In this regard, we find that

successful ecosystem leaders (i.e., case firms from E1, E3, and E4) develop dynamic capabilities in order to cope with the demands of ecosystem coordination and management. In contrast, the ecosystem leader in E2 that struggled to create a new innovative value proposition and viable ecosystem lacked capabilities such as complementary competence acquired through partnerships.

The analysis reveals that sensing, seizing, and reconfiguring capabilities, routines, and processes on the part of an ecosystem leader facilitates ecosystem-innovation orchestration through the joint process of value creation and capture with ecosystem partners. These findings build on the concepts of the microfoundations of capability Teece (2007) by identifying the formalized routines that underpin how firms secure competitiveness. In the following sections, we present our findings connected to sensing, seizing, and reconfiguring capabilities for ecosystem innovation.

Second, our study illustrates how ecosystem innovation is accomplished through the deliberate ecosystem orchestration through concrete mechanisms which leverage on the combination of dynamic ecosystem capabilities.
Third, contribute by empirical insights on the debate on the role of dynamic ecosystem capabilities for ensuring profitable smart cities initiatives.

10.7. Outros tópicos que não foram tratados aqui (sugestão para nova meta-informação ou resultados significativos): NADA

10.8. Proposições de pesquisas futuras (geral)

Another avenue for further inquiry is to investigate how innovation ecosystems in other sectors – for instance, smart mobility or smart living (Appio et al., 2019) or other industrial settings – are working in practice, and whether dynamic capabilities are relevant to those ecosystems. In addition, it is likely that the dynamic-ecosystem capabilities identified will have important implications for the transformation inherent in digital servitization of manufacturing firms generally (Kindström et al., 2013; Sjödin et al., 2020; Kamalaldin et al., 2020) as ecosystems are increasingly important for service innovation (Lütjen et al. 2019; Sklyar et al., 2019) business model innovation (Linde et al., 2021) and in the context of digital platforms and autonomous solutions (Thomson et al., 2021; Jovanovic et al., 2021). For example, manufacturing firms offering digital services often govern new partnerships involving multiple actors (Paschou et al., 2017; Sklyar et al., 2019; Sjödin et al., 2019) and are, therefore, likely to benefit from dynamic ecosystem capabilities such as directing roles and establishing processes to allocate resources amongst ecosystem partners.

10.9. Contribuições (para academia / prática / ambas?)

This study has both theoretical and practical implications relating to ecosystem innovation, dynamic capabilities, digital servitization, and smart city ecosystems. First, it proposes a general description of dynamic ecosystem capabilities and their micro-foundations. Second, our study illustrates how ecosystem innovation is accomplished through the deliberate ecosystem orchestration through concrete mechanisms which leverage on the combination of dynamic ecosystem capabilities. We approach this from

the perspective of the ecosystem leader and the orchestration of ecosystems. Third, contribute by empirical insights on the debate on the role of dynamic ecosystem capabilities for ensuring profitable smart cities initiatives.

11. Conclusões

Three of the cases, Ecosystem 1, 3 and 4, can be considered successful in their smart city initiatives and innovation ecosystem efforts; each was able to develop a new innovative value proposition and create a viable ecosystem that could deliver it to the market. Ecosystem 2 struggled, however, never advancing further than meeting with potential ecosystem actors to discuss new offerings such as 'Indoor-Climate-as-a-Service'.

11.1.Trabalhos futuros (que o autor se propõe, diferente das proposições futuras):
NADA

11.2.Limitações

We gained only limited insights into unsuccessful cases of ecosystem innovation because a majority of the cases we studied (three out of four) were successful in creating a viable ecosystem that could deliver a new innovative value proposition. We were only able to make a very rudimentary comparison of successful and unsuccessful ecosystems.

12. SUA ANÁLISE

12.1. Pontos fortes

O artigo abarca extenso referencial teórico, com a contribuição de artigos clássicos *versus* artigos contemporâneos, o que agrega bastante valor à literatura. Além disso, algo bem interessante na introdução é que eles acrescentam as características dos estudos de casos, os *findings* e implicações para a teoria e a prática.

12.2.Pontos fracos

As frases do artigo são muito longas e acabam tornando a leitura extensa e cansativa.

12.3. Sugestões para melhoria do artigo: NADA

13. Figuras ou tabelas importantes (caso você queira copiar e citar nos tópicos anteriores)

Fig. 1. Data structure: dynamic capabilities for ecosystem innovation.

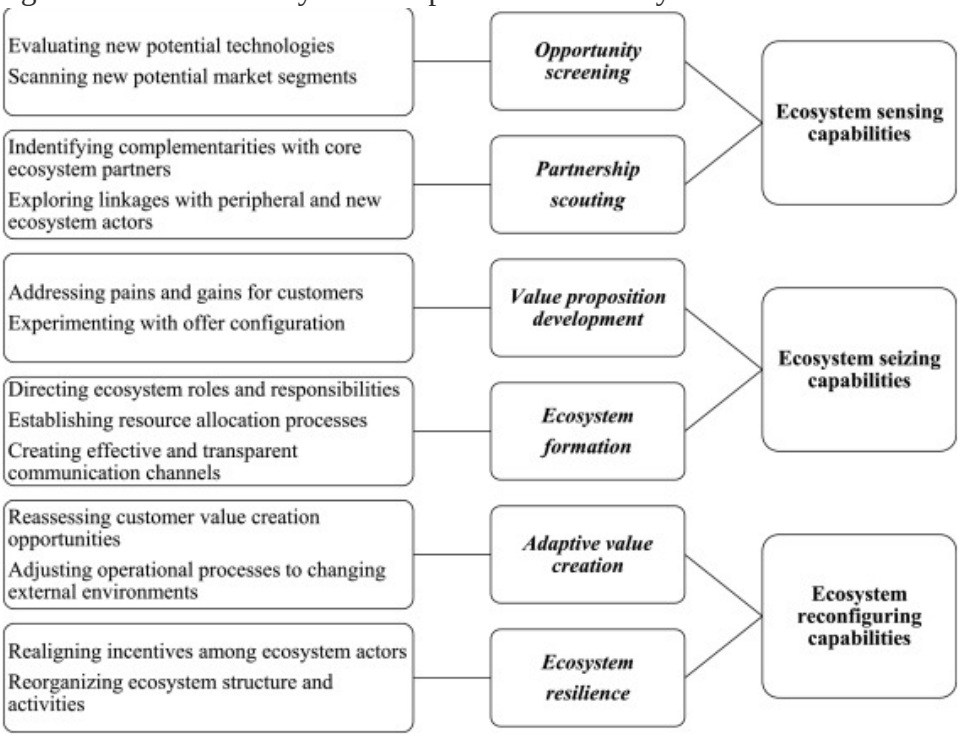

Table 1. Innovation ecosystem cases.

Table 1
Innovation ecosystem cases.

Smart city initiative area	Ecosystem, focal value proposition, and city information	Ecosystem actors(# interviews)	Total# Interviews	Sustainability benefits
Smart Utility	Ecosystem 1 (E1): The control room of the city City in south of Sweden (128,000 inhabitants)	Leader: Energy provider (5) Customer: Municipality (1) Other actors: System and technology provider (4), Digital platform provider (2)	12	*Energy savings through reduced water leakages *Optimization of heat distribution through peak load analysis
	Ecosystem 2 (E2): Indoor Climate-as-a-Service City in north of Sweden (79,000 inhabitants)	Leader: Energy provider (6) Customer: Construction company/property owner (5) Other actors: Technology provider (1), System provider (1), Municipality (1), Digital infrastructure provider (1)	15	* Improved indoor climate (e.g., air quality) * Optimization of heat distribution to balance peak load
Smart Buildings	Ecosystem 3 (E3): Smart building services City in south of Sweden (963,000 inhabitants)	Leader: Property developer (5) Customer: Construction company/property owner (3) Other actors: Digital platform provider (1), Carpool provider (2), Laundry service provider (1), Caretaker (1)	13	* Attractive residents enabled by smart home solutions * Optimization of resources thanks to sharing solutions
	Ecosystem 4 (E4): Energy optimization service City in south of Sweden (128,000 inhabitants)	Leader: System and technology provider (5) Customer: Energy provider (1) Other actors: Municipality (1), Technology wholesaler (1), Construction company (1)	9	* Efficient energy usage through smart systems * Balanced heating thanks to energy accumulation in building
			Total 49	

Table 2. Representative quotations for each of the six sub-themes.

Table 2
Representative quotations for each of the six sub-themes.

Sub-themes	Representative quotations
Opportunity screening	We want to systematically use our channels and connections out there, to scale up and find new opportunities – Ecosystem leader (E4) Change in our customer's [Ecosystem leader] business in relation to their customer has triggered this. We need to understand what we can do in terms of new solutions for them. So, we had several workshops to understand their needs. We had several visits inside and outside our organization to understand what they are looking for – System and technology provider (E1) [Digital platform provider] suggested a lot of interesting opportunities where we can connect new applications to their platform, for example, carpooling solutions and booking the laundry room – Ecosystem leader (E3)
Partnership scouting	We turned to both existing and new suppliers for help in solving this – Ecosystem leader (E1) We need to deliver full solutions instead, and then we need to acquire new competences inhouse, or outside our organization – Ecosystem leader (E2) We are working hard to sew it all together, all different actors… some might only have dialogue with us but, on many occasions, we need to gather multiple actors to achieve a finished offer – Ecosystem leader (E3)
Value proposition development	It could be the city, they would like to get the information about the pressure in the pipe that they can use for the fire department for example, and then they can have visualization of water pressure in the pipes to give guidance where to go and street work where they have restricted access to certain areas for example, and they are also trying to understand how they can sell their information to the house owners – System and technology provider (E1) We have all the technology available; we just need direction on what solutions to develop and what they [the ecosystem leader] want us to deliver – Digital infrastructure provider (E2) Together with [System and technology provider] we can come up with smart solutions that take us further with our common goal of contributing to a sustainable society – Energy provider (E4)
Ecosystem formation	And then, once the idea has been developed with key partners, we could go out to sub-suppliers and the whole ecosystem. – Ecosystem leader (E4) It is critical that we as leaders of these initiatives take an active role to drive in this direction, that we set the guidelines – Ecosystem leader (E4) That is the co-development and that should be free of charge for them [the customer], since they are putting in the same amount of time and effort to do that – System and technology provider (E1)
Adaptive value creation	We depend partially on [digital platform provider] to continuously develop and adapt the functions to respond to the customers' changing demands – Ecosystem leader (E3) There must always be continuity… we analyze the needs, adapt and develop solutions together with our suppliers – Ecosystem leader (E1) To be in the consortium requires something of you… you need to contribute so that the ecosystems continuously create value – Ecosystem leader (E4)
Ecosystem resilience	And then it is also the case that there is constantly new technology, new ways of thinking, new skills to incorporate – Ecosystem leader (E4) Our collaboration model requires us to continuously realign our incentives as we jointly decide on what development projects to invest resources in – Ecosystem leader (E1) To add and reconfigure the old ways of working is a huge challenge that hinders us from forming new partnerships – Ecosystem leader (E2)

Fig. 2. A dynamic ecosystem capability framework.