

Game-changers: dynamic capabilities' influence on service ecosystems

Abstract

Purpose – Service-dominant logic acknowledges that actors can influence how service ecosystems evolve through institutional work, but empirical research is only nascent. This paper advances understanding of ecosystem change by proposing that dynamic capabilities are a special type of operant resources enabling actors to conduct institutional work. Consequently, the purpose of this paper is to explore which dynamic capabilities are associated with proactively influencing service ecosystems.

Design/methodology/approach – Drawing on service-dominant logic, institutional work, and dynamic capabilities, this exploratory study assumes an actor-centric perspective and proposes a conceptual model with a hierarchy of dynamic capabilities as the antecedents for successfully influencing service ecosystems. The research model was tested with survey data using PLS-SEM.

Findings – Among the dynamic capabilities studied, 'visioning' and 'influencing explicit institutions' directly affect 'success in influencing service ecosystems', whereas 'timing' does so indirectly through 'influencing explicit institutions'. The other dynamic capabilities studied have no significant effect on 'success in influencing service ecosystems'. 'Success in influencing service ecosystems' positively affects the 'increased service ecosystem size and efficiency'.

Practical implications – In addition to reactively positioning and competing at the marketplace, firms can choose to proactively influence their service ecosystems' size and efficiency. Firms aiming to influence service ecosystems should particularly develop dynamic capabilities related to visioning, timing, and influencing explicit institutions.

Originality/value – This research is the first service-dominant logic investigation of the linkage between the actors' dynamic capabilities and their ability to influence service ecosystems.

Keywords: service ecosystem, service-dominant logic, dynamic capabilities, institutional work, PLS-SEM

Paper type: research paper

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Introduction

The context of value cocreation is increasingly conceptualized as a service system (Maglio *et al.*, 2009; Ng *et al.*, 2011, Chandler and Chen, 2016) or as a service ecosystem (Lusch *et al.*, 2010; Akaka and Vargo, 2015). A service ecosystem is “a relatively self-contained, self-adjusting system of resource-integrating actors connected by shared institutional logics and mutual value creation through service exchange” (Lusch and Vargo, 2014, p. 24). Service ecosystems are akin to natural ecosystems in their ability to emerge and to go through profound changes over time (Mars *et al.*, 2012; Lusch *et al.*, 2016). However, service ecosystems differ from their natural counterparts in being influenced by actor-created institutions and institutional arrangements (Vargo and Lusch, 2016). Or, as Mars *et al.* (2012) suggest: actors in service ecosystems “create strategies and structures (e.g., institutions)” and thus “organizations can design and master-plan systems and networks” (p. 277). Therefore, service-dominant logic acknowledges that actors can influence how service ecosystems evolve, but also notes that there is a dire need for more research on the topic (Chandler and Lusch, 2015).

In order to understand this phenomenon better, service-dominant logic has recently turned to institutional work (Sitaloppi *et al.*, 2016; Vargo and Lusch, 2016), which has a long tradition of investigating how actors can overcome the “paradox of embedded agency” and influence the institutions surrounding them (Battilana *et al.*, 2009; Garud *et al.*, 2007; Lawrence and Suddaby, 2006). However, Wilden *et al.* (2017) conclude in their recent systematic literature review that “ecosystems” and “institutions” do not yet appear as distinct themes in the service-dominant logic corpus, indicating that the related conceptual development is still in its infancy, and warranting more research.

Institutional work is commonly depicted as actions that actors conduct to create, maintain and disrupt institutions (cf., Koskela-Huotari *et al.*, 2016; Vargo and Lusch, 2016).

But what is the “action” referred to, exactly? As Vargo *et al.* (2015) conclude, our understanding of institutionalization processes in socio-technical systems is only nascent. Most of the current research either focuses on a very particular context (cf., Palmer *et al.*, 2015) or provides diverging lists of numerous actions related to institutional work. For example, Lawrence and Suddaby (2006) propose nine forms of institutional work to create institutions, six forms to maintain institutions, and three forms to disrupt institutions, whereas Battilana and D’Aunno (2009) put forward 21 forms of institutional work that are largely different from Lawrence and Suddaby’s (2006). Thus, more work is needed to develop a conceptually clear and parsimonious platform for theorizing.

An alternative way to approach institutional work can, however, be detected in service-dominant logic and its concept of operant resources, which encompass actors’ competencies and capabilities (Karpen *et al.*, 2015). As all capabilities concern the ability of actors to perform activities (Collis, 1994), these operant resources could be a durable way of explaining non-routinized action – such as institutional work – that is also compatible with service-dominant logic. This rationale is also in line with management literature, where Eisenhardt and Martin (2000, p. 11) connected dynamic capabilities with resource integration and changing the surrounding system, emphasizing that dynamic capabilities entail “the processes to integrate, reconfigure, gain and release resources — to match and even create market change”. More recent dynamic capabilities literature similarly highlights the connection between capabilities and actors’ ability to influence service ecosystems. Teece (2007, pp. 1319-1320) argues that dynamic capabilities “embrace the enterprise’s capacity to shape the ecosystem it occupies”. Dynamic capabilities provide, therefore, a micro-level foundation for the institutional work done by actors.

Building on the above discussion, the present research conceptualizes dynamic capabilities as a special case of operant resources underlying the institutional work done by actors. Therefore, the research question for this exploratory study is: which dynamic capabilities

are associated with proactively influencing service ecosystems? This research question also responds to Wilden *et al.* (2017), who explicitly call for future research integrating service-dominant logic and dynamic capabilities to develop a strategic approach to service-dominant logic.

Next, the paper discusses the literature related to service ecosystem change and dynamic capabilities. This theoretical background informs the conceptual framework, which is then tested empirically. Finally, the paper closes with conclusions to theory and managerial practice, as well as limitations and avenues for further research.

Conceptual background

Service ecosystem change

What is known about actors' ability to influence ecosystems and the eventual role that dynamic capabilities play in this? Previous conceptual work on service-dominant logic has framed firms as actors in dyads (micro-level), triads (meso-level), or networks (macro-level), and treated firms as actors influencing the system through multiple exchanges and resource integration (Chandler and Vargo, 2011). In turn, Siltaloppi *et al.* (2016) highlight the role of cocreation, since those authors, referring to Giddens, indicate that "institutions and institutional arrangements in service ecosystems can be seen to have only virtual existence that is inseparable from actors and their enactment of value cocreation practices, which produces and reproduces the institutional structure" (p. 336).

Despite the emphasis placed on actors and cocreation, recent research on service ecosystems change has mainly increased understanding of how change takes place at the system level. Aal *et al.* (2016) conclude that values resonance – the degree to which actors' foundational values (i.e., the normative and cultural-cognitive elements) are compatible – is both an enabler and a prerequisite for innovation to take place in service ecosystems. Chandler and Chen (2016) investigate micro-macro links in the service systems, and show that micro-

level practices shift in response to event triggers and that these practice shifts translate to changes at the service system level. Meynhardt *et al.* (2016) similarly focus on micro-macro dynamics and put forward systemic principles of value cocreation, which detail how self-organization and emergence take place on the service ecosystem level.

Understanding of how individual actors aim to influence the development of service ecosystems is, however, much scarcer. Current empirical investigations of how actors influence service ecosystems in practice tend to be limited to case studies (cf., Storbacka and Nenonen, 2011; Koskela-Huotari *et al.*, 2016). Storbacka and Nenonen (2011) propose that focal actors can offer market (service ecosystem) propositions which engage other actors in creating a shared market (service ecosystem) view – which consecutively may translate to corresponding changes in the mental and business models of all actors in the ecosystem. Koskela-Huotari *et al.* (2016) in turn apply institutional work to four cases depicting innovation in service ecosystems, and find evidence of interdependent breaking, making, and maintaining of institutions in each of the cases. However, their study concerns the “institutionalized rules of resource integration” – particularly implicit norms – rather than the strategies directed at shaping the explicit institutions of the ecosystem such as laws or infrastructures. Beyond these two pieces of research, authors are unaware of studies informed by service-dominant logic that investigate individual actors’ deliberate attempts to influence service ecosystems.

Dynamic capabilities and service-dominant logic

Adopting a focal actor perspective, as is done in this paper, allows the use of theories and frameworks that focus on the activities of an individual actor, such as business models and institutional work above. This paper proposes the use of a particular actor-specific lens – dynamic capabilities.

The concept of dynamic capabilities was introduced by Teece *et al.* (1997), drawing on the resource-based view (Wernerfelt, 1984; Barney, 1991). In their investigation of the

evolution and prospects of service-dominant logic, Wilden et al. (2017) highlight dynamic capabilities as one of the dominant change-related theories in management and call for future research integrating dynamic capability and service-dominant logic perspectives. The authors of the present paper concur, and propose that dynamic capabilities literature offers promising avenues for investigating change driven by individual actors – such as institutional work.

However, introducing new concepts to an established theory or framework should be done with full awareness of their underlying assumptions. When considering the compatibility of dynamic capabilities with service-dominant logic, three themes warrant particular awareness: 1) outcomes explained; 2) analytical level; 3) reactive vs. proactive approach. First, in terms of the outcomes explained, dynamic capabilities literature has been mainly interested in outcomes for the focal firm (e.g., financial performance, competitive advantage), whereas service-dominant logic advocates value creation to the beneficiary and the service ecosystem viability. However, the fourth foundational premise of service-dominant logic states that “operant resources are the fundamental source of strategic benefit” (Vargo and Lusch, 2016, p. 8), highlighting that service-dominant logic can also be used to understand outcomes for a particular actor. Furthermore, the recent service-dominant logic research suggests that the theoretical backdrop of dynamic capabilities, resource-based view (RBV), may be more compatible with service-dominant logic than previously thought. Drawing on Priem and Butler (1991), Peters (forthcoming) argues that RBV implicitly assigns primacy to the demand side, i.e., adopts beneficiary perspective.

Second, regarding the analytical level, service-dominant logic explicitly allows investigations on micro, meso and macro levels (Vargo and Lusch, 2016). Original literature on dynamic capabilities was primarily interested in understanding micro-level dynamics, whereas the more recent developments explicitly acknowledge the interdependence of actors, and that the actors’ dynamic capabilities have the potential to influence the larger surrounding system (e.g., Teece, 2007; Wilden et al., 2016).

Third, a corresponding change has been observed in the reactive vs. proactive orientation. Initial conceptualizations treated dynamic capabilities largely reactive, whereas the more recent dynamic capabilities literature increasingly acknowledges the ability of dynamic capabilities to proactively induce system-level change (e.g., Pitelis and Teece, 2010; Wilden *et al.*, 2016). Thus, it can be concluded that dynamic capabilities literature is conceptually moving closer to service-dominant logic.

Dynamic capabilities as micro-foundations for institutional work

Due to their definitional link to change, dynamic capabilities appear to be particularly important to actors operating in dynamic contexts (Wilden and Gudergan, 2015). However, whether change is conceptualized as exogenous or endogenous seems to be a defining factor in researching dynamic capabilities. As discussed above, earlier work on dynamic capabilities focused on defining the concepts and explaining firm performance, and (often implicitly) emphasized firms' ability to react to exogenous change (Wang and Ahmed, 2007; Pitelis and Teece, 2010; Wilden *et al.*, 2016). However, based on a comprehensive analysis of the dynamic capabilities literature, Wilden *et al.* (2016) suggest that dynamic capabilities are configured to fit the actor's particular strategic orientation – and that the defining dichotomy in strategic orientations resides in reacting to changes in the service ecosystem (“being market-driven”) vs. proactively changing the service ecosystem (“being market-driving”).

This dichotomy also affects the applicability of perhaps the most widely used categorization of higher-order dynamic capabilities, namely that of Teece (2007). Whereas Teece (2007) proposes that dynamic capabilities enable firms to: 1) sense and shape opportunities and threats; 2) seize opportunities; and 3) continuously align and re-align their resource base, this view has since incurred criticism for being more oriented towards a market-driven than a market-driving stance. For example, Wilden *et al.* (2016) suggest that sensing and

seizing, which Teece (2007) proposes as two of the main dynamic capabilities, are more suitable for reactive (“market-driven”) organizations.

Due to the previous emphasis of the dynamic capabilities literature on reacting to ecosystem changes, it appears that many of the existing categorizations of dynamic capabilities – such as sensing, seizing, and reconfiguring – are not directly applicable in the context of proactively inducing change in the service ecosystem. Actors aiming to influence service ecosystems will need different dynamic capabilities, related to, for example, generating increased customer value, exploration, and risk-absorption (Wilden *et al.*, 2016). Hence, there is great need for exploring the dynamic capabilities that drive ecosystem change.

Following the newer stream of dynamic capabilities literature, the present study draws from the definition of Barreto (2010), which delineates dynamic capabilities as a “firm’s potential to systematically solve problems, formed by its propensity to sense opportunities and threats, to make timely and market-oriented decisions, and to change its resource base” (p. 271). In order to preserve the parsimony of the conceptual hierarchy and lexicon of service-dominant logic, the present study proposes that dynamic capabilities are a special case of operant resources, and that actors apply ecosystem-driving dynamic capabilities when they conduct institutional work. This is in line with Madhavaram and Hunt (2008), who suggested that dynamic capabilities can be viewed as operant resources, a stance also taken by Karpen *et al.* (2015). Thus, the present study adopts the following definition of dynamic capabilities: dynamic capabilities are operant resources, working upon other operand and operant resources, that allow actors to systematically influence resource integration and institutions.

Investigating operant resources underlying institutional work can be considered a continuation of service-dominant logic’s actor-to-actor perspective. Since service-dominant logic embraced the notion of generic resource-integrating actors without pre-fixed roles such as ‘customer’ and ‘provider’ (Kjellberg *et al.*, forthcoming; Vargo and Lusch, 2011, 2016), it also recognized activities, resources and resource integration beyond the immediate monetized

exchange of service and/or service rights (Peters, forthcoming). Resources¹ and resource integration responsible for institutional work may not necessarily be market-facing, and thus they are often ignored by goods-dominant marketing. In contrast, service-dominant logic provides a coherent theoretical base for investigating such resources. However, it should be kept in mind that the value and “resourceness” of resources are always context dependent (Akaka and Vargo, 2014; Chandler and Vargo, 2011). Thus, dynamic capabilities responsible for institutional work in one context may not be operant resources – or resources at all – in another context.

The proposed theoretical framework

The link between dynamic capabilities and actors’ ability to induce change has already been acknowledged in the service-dominant logic literature on the micro level as some researchers have used dynamic capabilities to explain service innovations (cf., Agarwal and Selen, 2009; den Hertog *et al.*, 2010; Menguc and Auh, 2006; Ordanini and Parasuraman, 2011). However, the meso and macro level effects of dynamic capabilities on service ecosystems remain largely unknown: to the best of the present authors’ knowledge, no previous service-dominant logic research has investigated the linkage between actors’ dynamic capabilities and their ability to influence service ecosystems.

As support for identifying those dynamic capabilities that shape ecosystems, this paper draws on the literature on dynamic capabilities (Teece, 2007; Pitelis and Teece, 2010; Wilden, 2016), and service-dominant logic (Madhavaram and Hunt, 2008; Lusch and Vargo, 2014; Siltaloppi *et al.*, 2016). To date, the majority of dynamic capability researchers appear to agree that there are several types of capabilities, and that they exist at different orders, i.e., within a hierarchy of capabilities (Hine *et al.*, 2014; Madhavaram and Hunt, 2008). While the original

¹ In the interest of readability, the paper will use the term ‘dynamic capabilities’ throughout the manuscript, when referring to operant resources underlying institutional work to influence service ecosystems.

division was one between ordinary (non-dynamic) and dynamic capabilities (cf., Barreto, 2010), recently dynamic capabilities have been further divided into higher- and lower-order capabilities (Hine et al, 2014; Schilke, 2014). Nevertheless, the interaction between higher- and lower-order dynamic capabilities warrants more empirical research (Peteraf et al., 2013). Before discussing higher- and lower-order capabilities, the paper will first discuss the outcomes of ecosystem-shaping dynamic capabilities, i.e., the dependent variables of the proposed model.

Outcomes of dynamic capabilities for service ecosystem change

From a service ecosystem perspective, the relevant outcomes of higher- and lower-order capabilities are twofold. The first, direct outcome is success in influencing service ecosystems, which reflects actors' ability to deploy their dynamic capabilities. Second, if an actor is able to influence the service ecosystem, the overall ecosystem size and efficiency may increase (Narver and Slater, 1990; Baker and Sinkula, 1999; Jaworski *et al.*, 2000, Kumar *et al.*, 2000; Bharadwaj *et al.*, 2005). This second, indirect outcome – increased overall ecosystem size and efficiency – only relates to the actor's dynamic capabilities if the actor is able to influence service ecosystems, and that outcome therefore has no direct relationship with the dynamic capabilities. Building on the above, the paper proposes that success in influencing service ecosystems is positively related to increased service ecosystem size (e.g., collective market size and value creation to customers) and efficiency (e.g., more efficient use of resources):

H1: Success in influencing service ecosystems is positively related to increased service ecosystem size and efficiency.

Dynamic capabilities driving service ecosystem change

Identifying the dynamic capabilities that influence ecosystem change is more challenging than identifying the outcomes of dynamic capabilities on service ecosystem level, given the paucity of research on the interrelationships between dynamic capabilities and service ecosystems. Drawing upon a service-dominant logic view of actors as resource integrators (Vargo and Lusch, 2004; 2008), a dynamic capabilities view (Teece, 2007), and Barreto's (2010) definition of dynamic capabilities, as well as Marquis and Raynard's (2015) work on institutional strategies, this paper suggests two central higher-order dynamic capabilities that drive ecosystem change: 'visioning' and 'timing'.

The concept of 'visioning' develops further the central capacity of sensing opportunities (Teece, 2007). However, unlike traditional sensing, which often refers to reacting to external opportunities, 'visioning' for inducing ecosystem-level change takes a proactive stance. 'Visioning' requires understanding of the ecosystem development trajectory, and hence it refers to the ability to predict future development of the ecosystem. 'Visioning' also requires foreseeing what kind of development is benevolent for the focal actor – and the ability to communicate and track this vision. This interpretation is in line with Zahra *et al.* (2006), who consider visioning as foundational to dynamic capabilities: "there is a need for managerial vision in thinking about the firm's competitive arena and the trajectory of its future evolution" (p. 944). Similarly, Wang and Ahmed (2007) point out that it is important to "maintain a consistent long-term vision" (p. 44). 'Visioning' captures institutional embeddedness in that it also reflects the firm's ability to navigate between alternative (institutional) logics (Greenwood and Suddaby, 2006). Hence, for the purposes of this paper 'visioning' refers to a particular higher-order capability related to service ecosystems change.

The second higher-order capability in play, 'timing', builds upon the ideas of Teece (2007), Eisenhardt and Martin (2000), and Lusch (2011), according to whom "it is more and more important to have speed and adaptability. Increasingly it is who learns and implements

the quickest” (Lusch, 2011, p. 16). Many of the original references to ‘timing’ in dynamic capabilities literature emphasize the imperative of acting quickly (cf., Zott, 2003; Teece, 2007). However, when the objective is to influence service ecosystems, ‘timing’ also reflects attributes other than speed per se, in particular actors’ ability to understand the ecosystem’s speed of change and time their own actions accordingly. This forward-looking take on ‘timing’ echoes earlier studies, for example Day (1994), who suggested that “anticipation of future needs for capabilities” (p. 37) would be necessary for enhancement of capabilities, and Eisenhardt and Martin (2000), who argued that firms need to spot opportunities and act on them in a timely manner.

As discussed earlier, higher-order dynamic capabilities are those that have an indirect influence on performance (e.g., Zahra *et al.*, 2006) through lower-order capabilities. Hence, this study hypothesizes that ‘visioning’ and ‘timing’ influence service ecosystems indirectly through the lower-order capabilities. Drawing on structuration theory (Giddens, 1984), Vargo and Akaka (2012) conceptualize service ecosystems as having a dual nature: consisting both of interconnected relationships between actors and of social structures such as rules and resources. Thus, this paper hypothesizes that service ecosystems can be influenced by altering resources available to actors, relationships between actors, and institutions. Based on the literature review, these pathways have been further developed into four lower-order dynamic capabilities: ‘understanding actor resources and infrastructures’, ‘articulating value proposition’, ‘engaging with other actors’, and ‘influencing explicit institutions’. The authors will discuss each below in relation to service ecosystems change and will formulate hypotheses in which these lower-order capabilities mediate the effect of the higher-order capabilities ‘visioning’ and ‘timing’ on success in influencing service ecosystems.

Resource integration is central to structuration and re-structuration of service ecosystems (Vargo and Akaka, 2012; Koskela-Huotari *et al.*, 2016). However, not all resource integration is the same from the perspective of service ecosystem change. Peters (2016)

highlights the difference between homopathic and heteropathic resource integration. Homopathic resource integration is based on summative processes, where the effect of the integrated resources is identical to the sum of its parts. Heteropathic resource integration, on the other hand, is based on emergent processes and may lead to new properties on the service ecosystem level (Peters, 2016). Therefore, it is central for an actor aiming to influence service ecosystems to understand actors' resources and their possible homopathic or heteropathic properties. In addition to operant resources – resources capable of influencing other resources – ecosystem infrastructures constitute operand resources necessary for resource integration (Vargo and Lusch, 2004), and shaping the infrastructure is an acknowledged strategy for ecosystem change (Marquis and Raynard, 2015). Marquis and Raynard (2015) suggest that firms can influence ecosystems through social, technological, and physical infrastructures and by addressing socio-cultural issues which indirectly impact the ecosystem. However, change cannot be induced without understanding the state of the ecosystem. Hence, 'visioning' and 'timing' impact service ecosystems through the capability of 'understanding actor resources and infrastructures'. That is, if the actors wish to act upon their vision in a timely manner, they require insights into other actors' capabilities and operand resources residing in the service ecosystem. Consequently, it is suggested that:

H2a: 'Visioning' is positively related to the success in influencing the service ecosystem through 'understanding actor resources and infrastructures'.

H2b: 'Timing' is positively related to the success in influencing the service ecosystem through 'understanding actor resources and infrastructures'.

'Articulating value proposition' refers to the firm's capacity to define, communicate, and improve its value proposition to customers. Marketing and management research have agreed

on the importance of value proposing (see Storbacka *et al.*, 2016; Skålen *et al.*, 2015), and, in service-dominant logic, value propositions have an established role in the foundational premises (Vargo and Lusch, 2004; 2008). Recent service-dominant logic literature emphasizes that value proposing enables resource integration and supports relationship formation, thus contributing to ecosystem wellbeing (Ballantyne *et al.*, 2011; Frow *et al.*, 2014). Well-crafted and actionable value propositions enable actors to participate in value cocreation (Skålen *et al.*, 2015), since value propositions facilitate exchanges between ecosystem actors (Vargo and Lusch 2004; 2008; 2016). The relationship between value propositions and ecosystem change is also evident: as Frow *et al.* (2014) state, “the role of the value proposition within an ecosystem moves from the proposal of a resource offering between actors to shaping of resource integration between actors within the system” (p. 335). The basic, micro-level exchange takes place through value propositions, which become meso-level when extended to triads and macro-level when connected to networks (Chandler and Vargo, 2011). Hence, it can be argued that ‘articulating value proposition’ is a relevant dynamic capability linked to service ecosystem change. In a similar vein, Vargo and Akaka (2012) highlight “proposing value” as one of the key mechanisms involved in formation and re-formation of service ecosystems, and the impacts of ‘timing’ and ‘visioning’ are expected to be mediated by value propositions. Hence, it is proposed that:

H3a: ‘Visioning’ is positively related to the success in influencing the service ecosystem through ‘articulating value proposition’.

H3b: ‘Timing’ is positively related to the success in influencing the ecosystem through ‘articulating value proposition’.

The systems perspective on service ecosystems highlights that a service ecosystem is a network of interacting actors (Lusch *et al.*, 2010; Ng *et al.*, 2012). Thus, a service ecosystem is changed if new actors join the network, existing actors leave the network, or the relationships between the actors are altered. However, no actor is likely to have a unilateral ability to influence the composition of their actor network or the types of relationships occurring. Thus, this paper proposes that focal actors influence their relationships and thus the overall network through subtler actor engagement: for example, an actor may not be able to start a new relationship one-sidedly, but the actor can nevertheless engage with the other party. Building on extant research on customer engagement (cf., Brodie *et al.*, 2011), Storbacka *et al.* (2016) conceptualize actor engagement as a microfoundation for value cocreation, and they suggest that actor engagement is a prerequisite for resource integration – and thus for value cocreation. This perspective is echoed by Taillard *et al.* (2016), who suggest that interactions between actors are necessary for shared intentions between actors to emerge, something which in turn is required for ecosystem-level emergence. Hence, this paper hypothesizes that ‘engaging with other actors’ is a necessary capability for the focal actor to influence the service ecosystem. Thus, it is suggested that:

H4a: ‘Visioning’ is positively related to the success in influencing the service ecosystem through ‘engaging with other actors’.

H4b: ‘Timing’ is positively related to the success in influencing the service ecosystem through ‘engaging with other actors’.

The institutional work literature suggests that actors can alter institutions surrounding them (Lawrence and Suddaby, 2006). Thus, firms are both embedded in their institutional context (Chandler and Vargo, 2011; Sitaloppi *et al.*, 2016) and able to recreate that context. In many cases, this duality has been investigated from the macro-level perspective and downwards rather

than upwards from the micro-level: for example, Edvardsson *et al.* (2011) suggest that “studies could examine how changes in the macro-environment (such as new laws and regulations) affect service systems and actors” (p. 336). In accordance with this paper’s proactive approach, the present authors submit that it is equally important to understand how actors can induce change in institutions through their dynamic capabilities. This submission is aligned with the central tenets of service-dominant logic, which explicitly advocate the view that institutions and institutional arrangements are endogenously generated (Vargo and Lusch, 2016). Alvarez *et al.* (2015) highlight the role of actors in shaping institutions by “defining new institutional norms and regulations that govern the production, distribution, and consumption associated with these new opportunities” (p. 97). Accordingly, “actors work to influence their institutional contexts through such strategies as technical and market leadership, lobbying for regulatory change and discursive action” (Lawrence and Suddaby, 2006, p. 215). The existing studies show that institutional complexity inherent in service ecosystems is conducive to institutional work (Siltaloppi *et al.*, 2016) and that interdependent breaking, making, and maintaining of institutions is also valid when innovating service ecosystems (Koskela-Huotari *et al.*, 2016). Nevertheless, such work is preceded by ‘visioning’ and ‘timing’, which provide direction and understanding of when the work is beneficial. Hence, it is proposed that:

H5a: ‘Visioning’ is positively related to the success in influencing the service ecosystem through ‘influencing explicit institutions’.

H5b: ‘Timing’ is positively related to the success in influencing the service ecosystem through ‘influencing explicit institutions’.

Figure 1 summarizes the preliminary research model.

[INSERT FIGURE 1 ABOUT HERE]

Methodology

The study was conducted with firms related to the primary sector, which comprises agriculture, forestry, fishing, mining, and quarrying (Ravallion and Datt, 1996). Such a context has been previously studied from the service-dominant logic perspective (cf., Liang, 2017), and yet there has been no explicit attempt to examine service ecosystems related to the primary sector. The main criterion for including firms in the sample was previous experience in influencing their service ecosystems – for example, creating a market for a completely new type of service by an agricultural firm in collaboration with its partners – that had been documented in publicly available sources such as annual reports or articles in popular business press. The sampling of individual respondents focused on roles typically associated with strategy development and deployment (e.g., founder, chief executive officer, business development manager, vice president of strategy and planning). All firms consented to take part in the study under the condition of full anonymity. Data collection took place in May 2015 through a self-administered online questionnaire sent to 178 owners and senior managers, generating 127 replies (response rate of 71 percent), resulting in the final set of 106 responses after elimination of incomplete answers. Due to the exploratory nature of the research, the items were developed specifically for this study based on the existing literature (see Appendix A). All items were assessed on a seven-point Likert scale (1 = “strongly disagree”, 7 = “strongly agree”).

An exploratory factor analysis with principal components analysis (oblique factor rotation) was conducted for construct purification. One major difference emerged during this process in comparison to the preliminary research model: the dynamic capability of ‘engaging with other actors’ was divided into two constructs – ‘engaging with commercial actors’ and ‘engaging with non-commercial actors and understanding implicit institutions’. Hence, the dynamic capabilities are represented by seven constructs with two to five items each. In

addition, two constructs measure success in influencing service ecosystems and increased service ecosystem size and efficiency. Descriptive statistics for each construct are presented in Table 1. Appendix A provides information on individual items and their factor loadings.

[INSERT TABLE 1 ABOUT HERE]

In addition to the number of items per construct, Table 1 reports values for each construct's mean, standard deviation (SD), composite reliability (CR), average variance extracted (AVE) and its square root, as well as correlations between constructs. Due to the data collection method being restricted to a single data collection point, Harman's one-factor test (Podsakoff and Organ, 1986) was employed to assess common method variance, but no major issues were discovered.

Partial least squares structural equation modeling (PLS-SEM) was used to test the relationships between the constructs because: (1) it is suitable for exploratory studies; (2) no assumptions regarding the normal distribution of data are required; and (3) high levels of statistical power are achieved for complex models even when the sample size is relatively small, as in the present study (Hair *et al.*, 2014). The mediating effects were assessed following Zhao *et al.*'s (2010) guidelines for PLS-SEM analysis, as recommended by Hair *et al.* (2017). Since the PLS model in the present study contains more than one mediator, the study relied upon the extension of these guidelines for multiple mediation analysis in PLS-SEM (Hair *et al.*, 2017). As a result, all relationships were tested simultaneously within a single PLS model.

SmartPLS 3.2.6 software (Ringle *et al.*, 2015) was used in the analysis. For the bootstrapping procedure that allows testing of the significance of path coefficients, the recommended 5000 bootstrap samples (Hair *et al.*, 2017) were employed.

Results

The measurement and structural models were evaluated based on the guidelines from Hair *et al.* (2014; 2017). All indicators in the PLS model were specified as reflective following “classical test theory” (Hair *et al.*, 2017). Indicator reliability was achieved, since outer loadings of all indicators are higher than 0.70, with the exception of the item “The size of our market(s) has increased during the recent years” (outer loading 0.54). The composite reliability values are above 0.75 for all constructs (reported in Table 1), which means that internal consistency reliability is also achieved.

The AVE (average variance extracted) values for all constructs exceed 0.50 (see Table 1), which suggests sufficient levels of convergent validity. Discriminant validity is achieved, since: (1) outer loadings of all indicators are higher on their respective constructs than all cross-loadings with other constructs; (2) following the Fornell-Larcker criterion, the square root of each construct’s AVE is higher than any correlation with other constructs; and (3) following the HTMT (Heterotrait-Monotrait Ratio) criterion, the HTMT values for all pairs of constructs are well below the 0.85 threshold, and their respective confidence intervals do not include the value 1. VIF (variance inflation factor) values for all predictor constructs are higher than 0.20 and lower than 5, suggesting that there are no collinearity issues with the model. The results of hypothesis testing are reported in Table 2, which contains the path coefficients β together with corresponding *t*-values.

[INSERT TABLE 2 ABOUT HERE]

As Table 2 demonstrates, ‘success in influencing service ecosystems’ positively influences ‘increased service ecosystem size and efficiency’ ($\beta = 0.36, p < 0.01$), supporting H1. It was hypothesized that the lower-order capabilities would mediate the effect of the higher-order capabilities ‘visioning’ and ‘timing’ on ‘success in influencing service ecosystems’. However,

the study discovered that only one lower-order capability, ‘influencing explicit institutions’, acts as a mediator for a single relationship – the effect of ‘timing’ on ‘success in influencing service ecosystems’ ($\beta = 0.20, p < 0.01$). Since the direct relationship between ‘timing’ and ‘success in influencing service ecosystems’ is not significant, one can conclude that this mediating effect represents indirect-only or full mediation (Zhao *et al.*, 2010; Hair *et al.*, 2017). Thus, of hypotheses H2-H5, support was found only for H5b. Contrary to the hypotheses and the theories behind them, higher-order capability ‘visioning’ has a direct positive effect only on ‘success in influencing service ecosystems’ ($\beta = 0.29, p < 0.05$).

In addition, five significant relationships emerged between higher-order and lower-order capabilities that had not been hypothesized separately. ‘Visioning’ has direct positive effects on ‘understanding actor resources and infrastructures’ ($\beta = 0.41, p < 0.01$), ‘articulating value proposition’ ($\beta = 0.50, p < 0.01$), and ‘engaging with non-commercial actors and understanding implicit institutions’ ($\beta = 0.40, p < 0.01$); whereas ‘timing’ directly and positively influences ‘understanding actor resources and infrastructures’ ($\beta = 0.32, p < 0.01$) and ‘engaging with commercial actors’ ($\beta = 0.34, p < 0.05$). Finally, it emerged that four out of five lower-order capabilities do not have any influence on ‘success in influencing service ecosystems’. In contrast, ‘influencing explicit institutions’ has a strong positive effect on success in influencing service ecosystems ($\beta = 0.44, p < 0.01$).

Figure 2 visualizes the results of the exploratory study by showing the significant path coefficients, together with the R^2 values (coefficients of determination) of the endogenous constructs.

[INSERT FIGURE 2 ABOUT HERE]

As Figure 2 demonstrates, R^2 values for the endogenous latent variables do not exceed 0.44, supporting the conclusion that the model’s predictive power is moderate. Q^2 values were

calculated to assess the predictive relevance of the model. All Q^2 values are above zero, suggesting that the exogenous constructs have predictive relevance for the endogenous constructs (Hair *et al.*, 2014).

Conclusions

Theoretical contribution

Inspired by the service-dominant logic and management literature, this paper proposed that dynamic capabilities can be seen as a special case of operant resources, which actors employ to conduct institutional work and thus to ultimately influence service ecosystems. Even though service-dominant logic acknowledges that actors can influence how service ecosystems evolve by affecting the underlying institutions, and has called for more research on the topic (Chandler and Lusch, 2015), empirical studies on the dynamics of actor influence on service ecosystems are scarce.

The present exploratory research studied which actor-level dynamic capabilities are associated with successfully influencing service ecosystems. By showing that actors can shape ecosystems through specific higher- and lower-order dynamic capabilities, the findings extend Koskela-Huotari *et al.* (2016), who showed that actors can shape ecosystems by breaking, maintaining, and enhancing the institutionalized rules of resource integration on micro, meso and macro levels of the service ecosystem. Furthermore, this study answers the call for more research on the relationship between higher- and lower-order capabilities (Peteraf *et al.*, 2013), and shows that not all lower-order dynamic capabilities necessarily relate to ecosystem change, although they might influence actor's competitiveness or strategic benefit.

The findings of the study contribute to both the service-dominant logic and the dynamic capabilities literatures. First, the research builds on the existing service-dominant logic research by conceptualizing dynamic capabilities as a special case of operant resources (Madhavaram and Hunt, 2008; Karpen *et al.*, 2015) and suggesting that actors are able to use these dynamic capabilities to influence service ecosystems. Dynamic capabilities, therefore, enable actors to

conduct institutional work. This conceptualization – dynamic capabilities as operant resources with the capacity to influence service ecosystems – is both deeply rooted in service-dominant logic research and compatible with its core lexicon. This contribution responds to Wilden *et al.*'s (2017) call for future research integrating service-dominant logic and the dynamic capabilities view in order to develop a more strategic approach to service-dominant logic.

Second, both of the higher-order capabilities identified – ‘visioning’ and ‘timing’ – positively influenced the actors’ success in influencing the service ecosystem, the former directly and the latter via the ability to influence explicit institutions. This dual finding is aligned with the most recent advances in the dynamic capabilities literature, which suggest that actors who are strategically predisposed to proactively changing the service ecosystem require different dynamic capabilities than the more reactively-inclined sensing and seizing capabilities (Wilden *et al.*, 2016). Even though most of the dynamic capabilities literature has focused on sensing pre-existing opportunities, some authors have acknowledged the importance of proactive and creative visioning (e.g., Zahra *et al.*, 2006; Wang and Ahmed, 2007). In a similar vein, the importance of time and timing has been noted by several prominent dynamic capability scholars (cf., Eisenhardt and Martin, 2000; Teece, 2007; Zott, 2003). The present findings suggest that ‘timing’ should be elevated from an extraneous variable to a key dynamic capability. On the other hand, the identified higher-order capabilities suggest that service-dominant logic should direct more attention to concepts such as ‘vision’, ‘visioning’, ‘time’, and ‘timing’, which until now have been rarely discussed in the extant literature barring some individual exceptions (cf., Ojasalo *et al.*, 2015).

Third, the research identified five lower-order capabilities and investigated their role as mediators between the two higher-order capabilities and success in influencing service ecosystems. Surprisingly, only one of the lower-order capabilities – ‘influencing explicit institutions’ – had a direct effect on the success in influencing the service ecosystem, and acted as a mediator for ‘timing’, whereas all the other lower-order capabilities – ‘understanding actor

resources and infrastructures’, ‘articulating value proposition’, ‘engaging with commercial actors’ and ‘engaging with non-commercial actors and understanding implicit institutions’ – did not demonstrate direct effects, nor did they act as mediators. From the dynamic capabilities literature perspective, this finding questions Schilke’s (2014) suggestion that higher-order capabilities always demonstrate their impact via lower-order capabilities. For the service-dominant logic literature, this finding poses several implications. It suggests that many of the central constructs of service-dominant logic such as value propositions, resources, and relationships are not sufficient by themselves – even together – to explain how actors can influence service ecosystems. It may be that these lower-order dynamic capabilities relate to the micro-level dyadic exchanges rather than to service ecosystem change, and hence they might be more closely related to actor-level success factors such as profitability or sales. This calls into question to what extent ecosystem change is driven by understanding the market players and the infrastructure as reflected by engaging with commercial and non-commercial partners, and whether these capabilities are merely hygiene factors (necessary but not sufficient). It may also be that the mechanics through which dynamic capabilities influence ecosystem change are far more complicated than was tested for in the present study. For example, the effect of the dynamic capabilities of engaging with commercial and non-commercial actors may become visible in the long term, which requires a longitudinal research approach. Furthermore, it might be that the construct ‘articulating value proposition’ was restrictive in that it concentrated on the capability to communicate rather than the capability to radically change value propositions, which may undermine the importance of value proposing in general, and should be taken into account when interpreting the present results.

Fourth, the findings confirm the link between actors’ ability to influence explicit institutions and service ecosystem change. In particular, the findings of the present study corroborate the suggestion by Vargo *et al.* (2016) that service ecosystem change does not automatically occur when actors introduce new value propositions; system-level change takes

place only after the resulting new practices become institutionalized. However, new constructs are needed to further illuminate the lower-order capability of ‘influencing explicit institutions’. Of particular promise are ‘terminology’, ‘representations’, ‘regulations’ and ‘norms’, introduced to the service-dominant logic discourse in the early 2010s (Vargo, 2010; Vargo and Lusch, 2011) from the markets-as-practices approach (Kjellberg and Helgesson, 2006; 2007).

Finally, the findings suggest a strong link between actors’ ability to influence service ecosystems and the increased service ecosystem size and efficiency. This result is very well aligned with service-dominant logic’s notions of reciprocal and interconnected value creation, as innovating service ecosystems should result in more value for all actors involved. However, this recorded relationship between the ability to influence service ecosystems and the increase in ecosystem size and efficiency could also potentially work in the other direction, suggesting that actors are only able to influence service ecosystems if their vision for the future ecosystem holds promise of increased value cocreation opportunities for all (or several) actors. For the dynamic capabilities literature, on the other hand, this result suggests a novel and more systemic dependent variable: at the moment, the vast majority of the dynamic capabilities research has focused on investigating the relationship between dynamic capabilities and firm performance (Wang and Ahmed, 2007), leaving lesser attention to be paid to meso-level implications such as market size or value creation to other actors.

Managerial implications

Appreciating that the firm is not external to its “market” but embedded in its service ecosystem opens novel strategic options for managers. In addition to reactively positioning and competing at the marketplace, firms can choose to proactively influence their service ecosystems for increased size and efficiency. Hence, it is suggested that managers can broaden their scope from maximizing direct firm results towards creating an advantageous environment by actively influencing the political and judicial systems as well as cultural norms in their favor.

The findings suggest that firms seeking to influence their service ecosystems cannot rely on merely introducing new product or services – even if these new products or services offer dramatically improved value for the customers. Instead, firms aiming to influence service ecosystems should have a clear and compelling vision of how they would like to see their ecosystem developing. Additionally, such ecosystem-shaping firms should possess well-developed capabilities to influence terminology and regulations. Lobbying to alter restrictive regulations is a familiar part of the corporate strategic repertoire, but the possibility of introducing and altering names, terms, concepts or phrases is often overlooked in strategy work.

Furthermore, the findings show that managers should consider collaborating with other parties when influencing explicit institutions. For example, the findings suggest that being the organization that media and government officials turn to for advice or comments made it possible for the focal firm to successfully influence its institutional context. This highlights the importance of fostering relationships with media and government on multiple organizational levels, from top management to functional experts, to establish a key role for the firm within its service ecosystem.

Finally, firms are able to augment their ability to influence service ecosystems' explicit institutions by having a good understanding of the development speed of their ecosystem and timing their actions accordingly.

Limitations and future research

The present research deliberately took the perspective of a focal actor, and the study was conducted among commercial firms. These limitations should be kept in mind when assessing the findings. However, there are no reasons to believe that the identified dynamic capabilities for influencing service ecosystems – timing, visioning, and influencing explicit institutions – would not be applicable to other types of actors as well. In fact, other types of actors such as policy-makers and special interest groups might be better positioned to influence explicit

institutions than commercial firms. Thus, it is hoped that the identified dynamic capabilities for service ecosystem change provide a starting point for further research from the perspective of other actors, and thus a platform for developing a truly actor-to-actor view on service ecosystem change.

An additional limitation of this study is its focus on the positive outcomes of actor-specific dynamic capabilities. Due to ecosystem complexity, other, unintended outcomes might come about, or externalities might change the ecosystem beyond the control of the focal actor. Hence, different types of ecosystem changes might need to be identified, and control variables (e.g., power relations) might also need to be added. In addition, it might well be that some dynamic capabilities – or indeed lack thereof – might have negative consequences, such as unintended changes in relationships (exit, entrance or compilations of actors) or modifications in infrastructures.

Regarding the methodology of the paper, this study is limited to firms with previous experience in influencing their service ecosystems within the primary sector (already noted to comprise agriculture, forestry, fishing, mining, and quarrying). Future studies in other contexts and among actors other than commercial firms (e.g., special interest groups, public actors) are needed. Another limitation concerns the sample size: while it is not problematic per se due to the exploratory nature of the study and particular suitability of PLS-SEM for analyzing datasets of similar size and complexity (Hair *et al.*, 2017), testing the model on a larger sample would improve the generalizability of the results. In addition, the study cannot be considered longitudinal since data collection occurred at a single point in time – a fact which can be seen as a further limitation, albeit typical within the exploratory setting.

Also, the study design did not make it possible to study the respondent characteristics (e.g., age or profession) or enable the comparison of different actors or departments (e.g., marketing, manufacturing, accounting) within or across the firms. Hence, it is suggested that

future studies could examine the deployment of dynamic capabilities within and across firms to understand the ecosystem change more in-depth.

Finally, all variables used in this study are subjective; however, business scholars have consistently found that such measures lead to results that are not significantly different from those relying on so-called objective variables, as can be seen for instance in Dawes (1999), Wall *et al.* (2004), Singh *et al.* (2016), and Vij and Bedi (2016).

In terms of further research, the authors acknowledge that previous work on dynamic capabilities concentrated on explaining firm performance rather than ecosystem change (Wang and Ahmed, 2007), whereas the present study focused on actors' ability to drive change in service ecosystems. Hence, it is suggested that future research would study the relationship between firm performance and service ecosystem change.

The present research conceptualized dynamic capabilities as a special case of operant resources underlying the institutional work done by actors to influence the service ecosystems surrounding them. However, this study was exploratory in nature and identified only three dynamic capabilities with significant effect on success in influencing service ecosystems. Thus, the authors encourage future research on dynamic capabilities in the context of service ecosystem change. For example, influencing generally accepted social norms or industry conventions, influencing symbols legitimizing service ecosystems (such as industry/trade associations, events and awards), or renegotiating actors' roles in the service ecosystem may prove to be dynamic capabilities linked to institutional work. In particular, a longitudinal research approach might prove useful in outlining the interrelationships between institutional work, dynamic capabilities, and the service ecosystem's development, and eventual differences in the importance of particular dynamic capabilities for various types of ecosystems or an ecosystem's development trajectories (e.g., emerging vs. mature markets).

Future research should also examine the notion of dynamic bundles, i.e., combinations of resources and capabilities (Peteraf *et al.*, 2013, p. 1405), as resources and non-dynamic

(ordinary) capabilities were delimited from this exploratory study. Nevertheless, an increased understanding of such dynamic bundles in which dynamic capabilities and ordinary capabilities interact in resource integration and value creation could considerably advance service-dominant logic theorizing.

The authors also encourage further research on how the identified dynamic capabilities to influence service ecosystems are applied in practice. Merely knowing that capabilities related to visioning, timing, and influencing explicit institutions are needed illuminates only a fraction of the big picture – more detailed understanding is needed on how such capabilities are developed and used. Effectuation logic (Sarasvathy, 2001; 2009) and configuration (Miller and Friesen, 1984; Miller, 1987) theories could be particularly fruitful theoretical lenses to develop such an understanding.

Finally, as Kjellberg and Helgesson (2006; 2007) suggest, service ecosystems stem from multiple and overlapping market practices, whereas this study deliberately took the perspective of one focal actor and its dynamic capabilities for inducing service ecosystem change. Considering the interdependent nature of actors, this paper encourages future studies on the multiple actors' collective efforts to influence service ecosystems, and the role of dynamic capabilities in this interplay.

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APPENDIX A. Constructs and items used for the PLS analysis

Construct and corresponding items	Factor loading
<i>Success in influencing service ecosystems (based on Kumar et al. (2000); Eisenhardt and Martin (2000); Hills and Sarin (2003)):</i>	
We have successfully created new markets.	0.85
We have been successful in influencing our existing markets so that they work in our favour.	0.91
<i>Increased service ecosystem size and efficiency (based on Narver and Slater (1990); Bharadwaj et al. (2005); Baker and Sinkula (1999); Jaworski et al. (2000); Kumar et al. (2000))</i>	
The size of our market(s) has increased during recent years.	0.78
Our market creates more value to the end customers nowadays than it did a couple of years ago.	0.74
Our market uses resources more efficiently (for instance, faster transactions, less waste) nowadays than it did a couple of years ago.	0.56
<i>Visioning (based on Eisenhardt and Martin (2000); Day (2011); Zahra et al. (2006); Wang and Ahmed (2007); Kumar et al. (2000); Teece (2007); Jaworski et al. (2000); Hills and Sarin (2003))</i>	
We have a good ability to assess the predictability of our market's future development.	0.57
We have a clear vision for how we would like to see our market developing.	0.79
We are good at articulating this vision in such a way that it inspires also individuals outside our organisation.	0.83
We are good at developing new business initiatives that are 'win-win-win' (i.e., beneficial for us, our customers and our business partners).	0.91
We have a useful set of measures that enables us to evaluate whether our market vision is becoming a reality.	0.80
<i>Timing (based on Pavlou and El Sawy (2011); Teece (2007); Day (2011); Wang and Ahmed (2007); Jaworski et al. (2000); Kumar et al. (2000); Eisenhardt and Martin (2000); Barreto (2010); Zahra et al. (2006); Hills and Sarin (2003))</i>	
We are typically among the first to recognise the value of new information, resources and/or relationships.	0.74
We have a good understanding of how easy/difficult it is to change our operating environment.	0.72
We are typically among the first to recognise that a major change is about to take place in our operating environment.	0.94
We are good at accurately assessing the speed of change in our operating environment.	0.84
When timing new business initiatives, we systematically compare the pros and cons of being a first mover versus a follower.	0.70
<i>Understanding actor resources and infrastructures (based on Kumar et al. (2000); Storbacka and Nenonen (2015); Burr (2013); Cochoy (2009))</i>	
When developing a new business initiative, we analyse what kind of competences our customers need for the new business initiative to succeed.	0.89
When developing a new business initiative, we analyse what kind of competences our business partners need for the new business initiative to succeed.	0.83

When developing a new business initiative, we analyse what kind of infrastructure (e.g., broadband width, energy provision, or transportation capacity) is needed for the new business initiative to succeed.	0.69
Articulating value proposition (based on Kumar et al. (2000); Pavlou and El Sawy (2011); Jaworski et al. (2000); Hills and Sarin (2003))	
We have a well-defined value proposition, which is understood by our customers.	0.84
We are good at communicating the total value (economic and non-economic) of our products and/or services to customers.	0.83
We systematically evaluate possibilities to redefine our products and/or services in order to better achieve our overall objectives.	0.74
We have a good understanding of how our customers make their purchasing decisions.	0.70
Engaging with commercial actors ‡ (based on Jaworski et al. (2000); Hills and Sarin (2003); Kumar et al. (2000))	
We see our competitors also as important peers that contribute to the development of our market.	0.81
We have a good understanding of the players in our network: their roles, relative power, and the connections between them.	0.79
We are good at forming relationships with new commercial business partners (e.g., suppliers, distributors, customers).	0.75
Engaging with non-commercial actors and understanding implicit institutions ‡ (based on Jaworski et al. (2000); Hills and Sarin (2003); Kumar et al. (2000); Humphreys (2010))	
We are good at forming relationships with new non-commercial business partners (e.g., media, research institutes, governmental organisations, non-governmental organisations).	0.62
We actively engage with media to advance our new business initiatives (Note: this excludes paid advertisements).	0.87
When developing new business initiatives, we analyse how they are affected by the generally accepted social norms and conventions.	0.71
Influencing explicit institutions (based on Granqvist et al. (2013); Jaworski et al. (2000); Kumar et al. (2000); Hills and Sarin (2003); Alvarez et al. (2015))	
We have introduced or influenced the terminology that is commonly used in our market.	0.75
We influence industry standards (e.g., technological standards, industry self-regulation).	0.88
We influence government regulations (regional, national, or international).	0.83
External parties such as media and government officials regularly turn to our top managers and experts for advice and/or comments on topics related to our industry.	0.68
Notes: All items were measured with a seven-point Likert scale (1 = “strongly disagree”, 7 = “strongly agree”).	
‡ after the factor analysis, the hypothesized construct ‘engaging with other actors’ was separated into ‘engaging with commercial actors’ (ECA) and ‘engaging with non-commercial actors and understanding implicit institutions’ (ENCAUII).	
