Driving Generativity in Industrial IoT Platform Ecosystems

Short Paper

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Abstract

While the generativity of digital platform ecosystems has been studied extensively in many business-to-consumer domains, research on the novel phenomenon of IIoT platforms is sparse. The peculiarities of IIoT platform ecosystems are a double-edged sword: On the one hand, the heterogeneity of actors and devices leads to high generative potential. On the other hand, the resulting complexity can impede its realization. Even though generativity is often seen as a platform's inherent characteristic, our study suggests that it must be driven deliberately in complex domains like the IIoT. As initial results of a theory elaboration case study, we propose two modes that drive generativity in the form of a virtuous cycle by moving from abstraction of individual solutions to concretization of generic modules and vice versa. Our final results will contribute to extant literature on generativity in complex digital platform ecosystems and provide valuable insights for practitioners in the IIoT domain.

Keywords: Generativity, industrial IoT, digital platform ecosystems, platform governance

Introduction

The Internet of Things (IoT) has affected how industry firms create and capture value moving slowly but surely from product-oriented supply chains to service-oriented ecosystems. These ecosystems are often formed around a digital platform (Hein et al. 2019; Hodapp et al. 2019). For example, Siemens, a large European industrial company, has launched its industrial IoT (IIoT) platform MindSphere in 2017. As an industrial operating system, MindSphere enables external firms to (1) connect and manage their devices, (2) communicate, store, and analyze data in its cloud, and (3) develop IIoT applications, such as predictive maintenance services, for different industry verticals (Petrik and Herzwurm 2019). Hence, IIoT platforms like MindSphere represent a generative system (Pauli and Lin 2019).

In this paper, we refer to generativity as a digital platform's capacity "to produce unprompted change driven by large, varied, and uncoordinated audiences" (Zittrain 2006, p. 1980). Digital platform ecosystems are shifting the locus of value creation from inside the firm to an ecosystem of complementors (Constantinides et al. 2018; Parker et al. 2017). These third-party firms leverage the core modules of the platform to develop peripheral modules or applications to increase technological variety that serves many value propositions and increases platform adoption (De Reuver et al. 2018; Tilson et al. 2013). For example, Apple provides developers with software tools like Xcode, Swift, or the ARKit to enable individual development endeavors. Developers can, in turn, use these boundary resources provided by Apple's platform ecosystem to develop novel iOS applications for the iPhone or other devices. The platform's generativity leverages both internal (platform owner) and external (complementor) innovation output.

Initial insights indicate that generativity is difficult to achieve in IIoT platform ecosystems due to their high technological and organizational complexity (Hein et al. 2019; Pauli and Lin 2019). Although information systems (IS) research has studied generativity in digital platform ecosystems as well as governance mechanisms that foster it (Eck and Uebernickel 2016), most studies focus on business-to-consumer (B2C) markets with prominent examples, such as Apple's App Store (Eaton et al. 2015), Mozilla's Firefox browser ecosystem (Tiwana 2015), or Sony's PlayStation (Cennamo and Santaló 2019). In contrast, research on business-to-business (B2B) platform ecosystems is sparse with some exceptions stemming from the enterprise software domain (Huber et al. 2017; Sarker et al. 2012; Wareham et al. 2014) and initial studies emerging in the IIoT (Hein et al. 2019; Hodapp et al. 2019; Pauli and Lin 2019). As a result, there are few, if any, theoretical accounts of what strategies actors can pursue to drive generativity in complex environments like the IIoT. We thus seek to bridge this void by addressing the following research question: *How can generativity be stimulated in IIoT platform ecosystems?*

To answer this research question, we conduct a theory elaboration case study (Ketokivi and Choi 2014) at a large telecommunication provider which recently tapped into the IIoT platform market. The paper at hand presents preliminary results of the first conceptual phase of our study. To this end, we conducted a literature review on generativity in digital platform ecosystems and—guided by our first semi-structured interviews—mapped our findings to the IIoT domain. Drawing on the service-dominant logic and the concept of boundary resources as an analysis lens, we present our initial model, illustrating how actors can drive generativity. In particular, we propose two modes—*Mode 1: diversity of end-to-end solutions* and *Mode 2: diversity of modules*—that reinforce each other moving from abstraction to concretization and vice versa. We argue that the application of both modes may finally result in a virtuous cycle of generativity.

We offer the modes together with their underlying governance mechanisms to contribute to prospective theorizations on the strategies that drive generativity in complex digital platform ecosystems, especially in the IIoT (Hein et al. 2019; Pauli and Lin 2019). With that, we see great potential in the research project to shift the ongoing debate on balancing control and generativity (Wareham et al. 2014) to the actions needed to deliberately stimulate generativity (or external innovation) in the IIoT. In addition, our results provide practitioners in the IIoT business with initial guidance on how to drive generativity.

Theoretical Background

Digital Platform Ecosystems and Generativity

We conceptualize *digital platform ecosystems*, which are based on digital platforms (Constantinides et al. 2018; De Reuver et al. 2018) and business ecosystems (Moore 1993), as collaborative arrangements among economic actors who are centered around a focal firm's digital platform (Adner 2017; Jacobides et al. 2018; Lusch and Nambisan 2015). These actors develop and exchange technical artifacts via a platform and thus add functionality in the form of peripheral modules (De Reuver et al. 2018; Selander et al. 2013; Tiwana et al. 2010; Yoo et al. 2012). Modules include generic functional specifications to meet the needs of various end-users (Tiwana et al. 2010) ranging from browser plug-ins (e.g. Mendeley's Web Importer) to mobile games (e.g. Niantic's Pokémon GO) to industrial services (e.g. Siemens's Asset Performance Monitoring). Following this socio-technical view (Bostrom and Heinen 1977), digital platform ecosystems generate a variety of applications on an unanticipated scale (Tilson et al. 2010; Yoo et al. 2010).

Generativity represents the scale of complementary output, i.e. the digital platform ecosystem's ability to fuel the generation of complementary applications by autonomous actors (Cennamo and Santaló 2019; Tilson et al. 2010; Yoo et al. 2010). The concept was originally defined as "a technology's overall capacity to produce unprompted change driven by large, varied, and uncoordinated audiences" (Zittrain 2006, p. 1980). Accordingly, generativity necessitates core modules (digital platform), resources to utilize them (boundary resources), and a variety of actors who bring in individual domain-knowledge and innovation capabilities (value cocreation) (Tiwana et al. 2010). For example, Apple's platform comprises the mobile operating system iOS (to develop apps), the App Store (to access apps), and the iPhone (to use apps). Apple provides boundary resources, such as application programming interfaces (APIs) and software development kits (SDKs), to reduce individuals' development efforts. With every new iOS application, Apple addresses more consumer needs and drives the generativity of the overall platform ecosystem (Eaton et al. 2015). However, developers must follow the rules that Apple imposes in terms of development and commercialization.

The question of how to drive generativity in digital platform ecosystems dates back to the early 2000s—with works on "complementary innovation" and "modular substitution" (Gawer and Cusumano 2002; West 2003)—and has recently received much attention in the IS community (Cennamo and Santaló 2019; Eaton et al. 2015; Hein et al. 2020; Tilson et al. 2010). Eck and Uebernickel (2016), who conducted an in-depth review of 20 IS-papers on generativity, identified two distinct perspectives: *generative properties* and *generative patterns*. While the latter view emphasizes the evolutionary character of generativity that leads to changes even beyond the system designer's original intentions (Henfridsson and Bygstad 2013; Tilson et al. 2010), the former view defines generativity as a consequence of system design, making a system's degree of generativity comparable to others as a function of its inherent qualities (Eaton et al. 2015; Wareham et al. 2014). This means that the degree of modularity (Yoo et al. 2010), the diversity of boundary resources (Ghazawneh and Henfridsson 2010), or the pricing decisions (Schreieck et al. 2016) made by the platform owner affect generativity. In this sense, the generativity of a digital platform ecosystem can be influenced by the governance strategies employed by the platform owner (Marheine 2020).

Platform governance refers to the rules and processes, designed by the platform owner, that prescribe the development and commercialization opportunities of complementors (Ghazawneh and Henfridsson 2013; Tiwana 2015). Platform governance has an architectural and a relational dimension (Van Alstyne et al. 2016). Architectural governance targets the platform's properties and functionalities and is thus shaped by mechanisms like APIs (ways to interact with the platform), SDKs (ease to develop), and the frequency of changed modules (Tiwana et al. 2010). As such, a platform's architectural design has an effect on relational governance as it can lower or increase coordination efforts in value cocreation activities. Relational sources to leverage generativity have pointed, for example, to the alignment and intensity of ties between vendors and partners (Sarker et al. 2012). For instance, Apple's generativity depends on its platform architecture and the organizational relationships it spans. If Apple did not provide development kits for new pieces of software or forgo its international developer conferences, not nurturing close ties to developers, it could affect individuals' development progress and business models. Hence, the design of both architectural and relational governance can foster or impede generativity (Eaton et al. 2015; Tilson et al. 2010).

Mapping Related Work on Generativity to the IIoT Domain

Most related work on generativity relies on extreme cases with a consumer focus (Cennamo and Santaló 2019; Eaton et al. 2015; Tiwana 2015) that follow a winner-takes-all logic and emphasize network size and the quantity and quality of complements (Boudreau 2012). In smart factories—the paragon of the IIoT—platforms are used to connect the industrial assets to a firm's information systems and business processes with the goal to analyze more data sources improving industrial operations (Sisinni et al. 2018). With that, IIoT platforms can help factories to become "smart", facilitating the emergence of new business models and opening up for complementary innovation by third parties. Digital platform ecosystems with such business focus have smaller networks and display higher levels of complexity (Tilson et al. 2013) emphasizing the need for novel strategies to drive generativity. Research in the nascent field of IIoT platform ecosystems has therefore tried to study different governance mechanisms to stimulate innovation by third parties.

In particular, Hein et al. (2019) studied value cocreation activities among actors in IIoT ecosystems and found three practices to drive them: supply-side integration, demand-side platform readiness, and servitization through application enablement. Marheine (2020) identified five governance strategies in IIoT platforms based on a multiple case study and emphasized that the degree of platform openness was not comparable to the scale of B2C domains and would depend on the owner's traditional business. Petrik and Herzwurm (2019) studied three types of boundary resources of Siemens MindSphere, namely technical, development, and social boundary resources. Even though these studies highlight different governance mechanisms to leverage generativity, they view it as an implicit characteristic of IIoT platform ecosystems. As a result, they do not provide insights on how to drive generativity in such complex environments in the first place. However, as actors in nascent IIoT platform ecosystems are facing significant challenges with regard to value cocreation (Hodapp et al. 2019), such insights are needed to overcome these complexity-related challenges and drive generativity. This is underlined by recent studies that found IIoT platform ecosystems not to be as "generative" as many of their B2C counterparts because of many impeding factors such as the high cost and complexity of complement development and adoption insecurity (Pauli et al. 2020; Pauli and Lin 2019).

We thus try to synthesize the studies' key arguments for increased complexity in the IIoT and structure our line of thought using the tripartite framework of Lusch and Nambisan (2015), i.e. ecosystem, platform, value cocreation. First, ecosystems and their constituting actors are legal organizations and, as such, diverse and oftentimes interdependent (e.g. device manufacturers, system integrators, consultancies). Second, the core modules of an IIoT platform must be generic enough to be compatible with a broad range of hardware (e.g. sensors, machines) and software (i.e. communication protocols, enterprise systems) and specific enough to bear a value across different industry verticals (e.g. agriculture, manufacturers, logistics). Third, value cocreation in the IIoT is more complex because of the diversity of industries and heterogeneity of customers and devices which requires complementors to have the appropriate domain know-how and the capabilities to implement end-to-end (E2E) solutions with different integration, security, and reliability requirements (Hein et al. 2019; Sisinni et al. 2018). Therefore, generativity as defined by Zittrain's (2006) will not be applicable unconditionally to IIoT platforms (Pauli and Lin 2019).

In conclusion, these peculiarities of IIoT platform ecosystems are a double-edged sword: On the one hand, heterogeneity of actors and devices increases a system's generative potential (Yoo et al. 2010). On the other hand, the diversity and individuality of customer settings and the challenging requirements regarding integration and reliability impede the manifestation of the generative potential, especially in the form of a variety of generic solutions (i.e. modules) available to the whole ecosystem (Pauli et al. 2020). To resolve this contradictory dualism, governance strategies are needed that enable the actors in IIoT platform ecosystems to drive generativity in the sense of a complementary duality (Wareham et al. 2014).

Research Method

Our research follows a theory elaboration approach as proposed by Ketokivi and Choi (2014). Case studies with the objective of theory elaboration place equal importance to theory and empirical evidence (Ketokivi and Choi 2014). To this end, the researcher takes general theory and analyzes it in light of the specific empirical context. The resulting "preexisting conceptual ideas or a preliminary model" (Fisher and Aguinis 2017, p. 441) form the basis for the subsequent iterative examination of the empirical material. Thus, our research project consist of two phases and a total of three steps: (1) literature review, (2) transfer to domain, and (3) empirical evidence (Ketokivi and Choi 2014) (see Table 1).

In the paper at hand, we present the **conceptual definition phase** of our research-in-progress in form of our preliminary model (see Figure 1). We drew our theoretical preunderstanding from a literature review and mapped concepts of the general theory on generativity to the domain of IIoT platform ecosystems. The **(1) literature review** traversed three steps. First, we scanned related work on digital platform ecosystems (De Reuver et al. 2018) and generativity—a topic sparked by two calls for research (Tilson et al. 2010; Yoo et al. 2010). Due to the 10-year gap between both calls and today, we followed a journal-based search with a focus on the AIS Senior Scholars' Basket, checking the titles, abstracts, and keywords of each hit for "generativity" in the context of platforms. Second, we complemented the journal papers with conference papers (e.g. ICIS, ECIS) to include some of the latest findings. We were able to double-check these results with the review of Eck and Uebernickel (2016). Third, we performed a forward and backward search which led to a final list of 34 papers that we analyzed in depth. As some of these papers related to both our concept and domain of interest (e.g. Hein et al. 2019) they supported us in the **(2) transfer to domain**.

The theoretical preunderstanding presented in this paper will guide our **empirical elaboration phase** as the next step in our study. The objective of this phase is to go back and forth between empirical evidence and the preliminary model and extend existing theory by analyzing it in light of the empirical observations (Fisher and Aguinis 2017). In contrast to a theory testing approach, however, the researcher does not intend to purely test preconceived hypotheses, but strives to maintain "a logic of discovery rather than only a logic of validation" (Van Maanen et al. 2007, p. 1146). Our case analysis will rest on **(3) empirical evidence** from a large European telecommunication provider called TelcoCorp (for reasons of anonymity), which has recently tapped into the IIoT market with its IIoT platform ecosystem. TelcoCorp's platform enables firms to build a variety of IIoT solutions, e.g. optimized production in the medical technology industry, improved customer experience in the brewery industry, or cleaning robots for facility management. In sum, TelcoCorp combines its connectivity business (horizontal approach) with its system integration business (vertical approach)—a balancing act that can provide new insights into generative properties or patterns. So far, we have conducted four initial interviews with the head of IoT (I1), an IoT project manager (I2), the head of analytics (I3), and the head of sales IoT (I4)—each lasting over an hour.

Table 1. Research Design

Phase	Step and outcome	Scope
Conceptual definition (Theory focus)	**(1) Literature review** • A set of relevant papers on generativity in digital platform ecosystems (N=34) **(2) Transfer to domain** • A model (Figure 1) to drive generativity in IIoT platform ecosystems	**Paper at hand**
Empirical elaboration (Empirical evidence focus)	**(3) Empirical evidence** • A series of interviews with TelcoCorp, partners, and customers • A refined/extended model and set of governance mechanisms for both modes	In progress

Driving Generativity in IIoT Platform Ecosystems

Guided by our conceptual definition phase, we present two modes that drive generativity in IIoT platform ecosystems. In particular, we follow Hein et al. (2019) and combine the service-dominant (S-D) logic (Lusch and Nambisan 2015) and the theory of boundary resources (Ghazawneh and Henfridsson 2010, 2013) as an analysis lens to uncover how the two modes differ from and interact with each other. The S-D logic theorizes how actors cocreate services in digital platform ecosystems and is thus appropriate to analyze how generativity can be stimulated. We use the ecosystem, platform, and value cocreation dimensions of the S-D logic to organize our findings (Lusch and Nambisan 2015). The concept of boundary resources emphasizes the diversity of a platform's technical and social software-based tools that seek to support complementors' development endeavors (Ghazawneh and Henfridsson 2010, 2013). We draw on this concept to emphasize the relative importance of boundary resources in both modes.

Figure 1 presents our model and lists each mode's explanatory governance mechanisms which will guide our empirical elaboration phase. Following the lines of the head of IoT at TelcoCorp—*"When we talk about IIoT solutions, for the moment, they will always be a mixture of horizontally scalable and vertical individual solutions" (TelcoCorp_I1)*—generativity in IIoT platform ecosystems needs to be viewed along two dimensions: the diversity of E2E solutions and the diversity of generic modules. While customers are primarily interested in specific vertical solutions (Schermuly et al. 2019), the platform owner as well as the complementors have great interest in horizontally scalable ones. Coming back to the double-edged sword metaphor discussed above, our model resolves the dualism of heterogeneity-driven generative potential, on the one hand, and complexity-related barriers, on the other hand. Our model proposes to exploit the heterogeneity by driving E2E IIoT solutions and overcome the complexity by driving horizontally scalable modules.

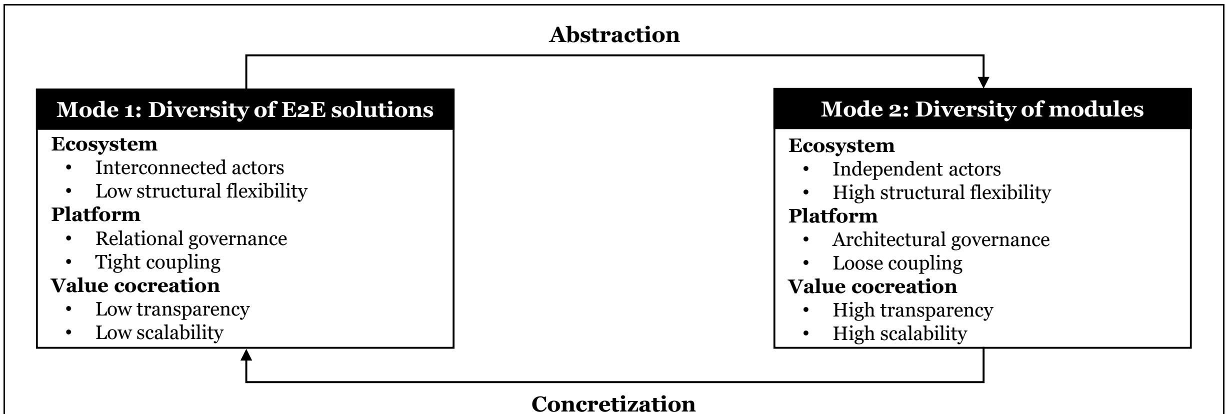
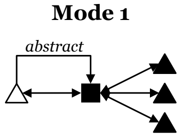


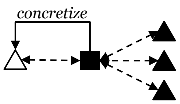
Figure 1. A Virtuous Cycle of Generativity

Mode 1: Diversity of E2E solutions drives generativity indirectly as the platform owner coordinates a set of economic actors beyond the platform's boundaries to cocreate E2E customer solutions, while parts of the solution can afterwards extend the platform through abstraction. Here, the cocreating actors are *interconnected* (or mutually dependent) in terms of resources and capabilities. As most IIoT vendors cannot provide a one-stop E2E solution, they cooperate with sensor manufacturers, connectivity providers, cloud partners, and software developers to cover all technical layers, i.e. device, connectivity, middleware, and applications (Guth et al. 2018; Petrik and Herzwurm 2019). While customers contribute their domain knowledge, defining and communicating requirements, platform owners and their trusted partners drive the development of E2E solutions, which allow for *low structural flexibility* (**ecosystem**). The cocreation of E2E solutions follows a project logic, which goes beyond the provision of boundary resources, emphasizing *relational governance* over architectural governance. Our preliminary case results demonstrate that most customers ask TelcoCorp for E2E solutions as their standard services do not fit all settings. E2E solutions require larger integration effort at the customer site which is often supported by the platform owner or integration partners. Thus, E2E solutions are *tightly coupled* (**platform**). Also, E2E solutions lead to *low transparency* in systems, processes, and actors involved. TelcoCorp, for example, faces large coordination efforts and constant tensions of *"who does what"* (I2) in the partner ecosystem. TelcoCorp aims at resolving such tensions through dedicated governance mechanisms, such as cocreation workshops (I3). Even though customers benefit from well-integrated E2E solutions, they run counter to standardized processes and value exchanges over the platform (Hein et al. 2019). Partners, who are repeatedly preferred over others for E2E projects, might cause tensions in the ecosystem affecting the individual's value capture opportunities and the collective's worldview (Huber et al. 2017; Wareham et al. 2014). Lastly, while E2E solutions have *low scalability*, they help the IIoT platform ecosystem to build a strong reputation and capitalize on follow-up projects (**value cocreation**). Even though Mode 1 functions stand-alone, platform owners and partners have a great interest in feeding back parts of E2E solutions into the platform to increase its resource richness (Ghazawneh and Henfridsson 2013; Lusch and Nambisan 2015). We refer to this process as **abstraction**.

Mode 2: Diversity of modules drives generativity directly, as the platform owner enables economic actors within the platform's boundaries to develop and to commercialize peripheral modules, while these can afterwards be tailored to the customer through concretization. In this mode, the cocreating actors are mostly *independent* of each other. Yet, they must still follow the rules, dictated by the platform owner, to integrate their modules (Ghazawneh and Henfridsson 2010, 2013; Hein et al. 2019). Accordingly, Mode 2 provides *high structural flexibility* to all actors (**ecosystem**). To support this process, platform owners focus on *architectural governance* and provide boundary resources. While technical resources like APIs and SDKs regulate the access of functionality and reduce development efforts, social boundary resources, such as developer communities and hackathons, foster development success and community building (Marheine 2020; Petrik and Herzwurm 2019). Therefore, Mode 2 emphasizes *loosely coupled* modules. For example, customers of Siemens MindSphere can decide to use the predictive maintenance application of Siemens or that of a third-party developer (**platform**). Also, all of the standardized services offered on top of the platform are characterized by *high transparency* and *high scalability*. Yet, offering apps in the IIoT is often not enough to meet the requirements of industry customers who face connectivity (e.g. long vs. short range, high vs. low frequency), integration (e.g. legacy systems), and deployment (e.g. local vs. global) challenges (**value cocreation**). Hence, standard modules must be recombined, integrated, or customized to the customer's needs, leading back to Mode 1. We refer to this process as **concretization**. Since Mode 1 flows into Mode 2 through the process of abstraction and vice versa in the form of concretization, we propose a virtuous cycle that indirectly (Mode 1) and directly (Mode 2) reinforces generativity. Table 2 synthesizes our preliminary results in form of a visualization, conceptual description, and first empirical evidence based on interviews with TelcoCorp.

Table 2. Preliminary Results

Mode	Conceptual description	Preliminary empirical material
Mode 1 	Mode 1 drives generativity indirectly, as the platform owner coordinates a set of economic actors beyond the platform's boundaries to cocreate E2E customer solutions, while parts of the solution can afterwards extend the platform through abstraction.	*"When we talk about IIoT solutions, for the moment, they will always be a mixture of horizontally scalable and vertical individual solutions." (TelcoCorp_I1)* *"[...], I get a customer call for a project and then gather the partners who can do the job." (TelcoCorp_I1)* *"We currently look for bits that we can standardize and reuse. Standardization benefits everyone." (TelcoCorp_I2)*

Mode 2  	Mode 2 drives generativity directly, as the platform owner enables economic actors within the platform's boundaries to develop and to commercialize peripheral modules, while these can afterwards be tailored to the customer through concretization.	*"We offer some standard applications on top of our IoT platform, especially analytics dashboards" (TelcoCorp_I3)* *"Such customization projects are ways to deepen our customer relationships and extend our business. Why should I let someone else do the job?" (TelcoCorp_I3)* *"We especially need partners for the sensor devices and domain know-how […] Compatibility is key" (TelcoCorp_I4)*
△ *Demanding actor (customer)* ■ *Platform owner (with platform)*	▲ *Supplying actor (complementor)* → *Mode transitioning (abstract or concretize)*	↔ *Tight coupling* ◂- -▸ *Loose coupling*

Discussion and Next Steps

Synthesis of preliminary results. This short paper presents two modes to drive generativity in nascent, complex digital platform ecosystems: Mode 1 and the process of abstraction and Mode 2 and the process of concretization. Guided by the conceptual definition phase, our preliminary results illustrate why scholars should distinguish precisely between different types of digital platform ecosystems and the mechanisms that may or may not apply. IIoT platform ecosystems, as more complex types, emphasize Mode 1 and the process of abstraction to drive generativity in addition to the well-known Mode 2 highlighting the provision of boundary resources. We thus propose to shift the view to the economic actors who require new types of relational resources and patterns to effectively cocreate value in complex environments like the IIoT.

Initial contributions. In line with the chosen theory elaboration approach, our initial model is anchored in existing theory. As a consequence, the preliminary results presented in this paper contribute to ongoing discourses by "modifying the logic of general theory in order to reconcile it with contextual idiosyncrasies" (Ketokivi and Choi 2014) of the IIoT platform domain. The absorption of peripheral innovation into the platform, for example, has been discussed extensively in the literature (Parker et al. 2017; Sarker et al. 2012; Schreieck et al. 2017). These studies approached generativity from a value capture perspective, seeing it as an outcome of the platform ecosystem (Hein et al. 2020). Even though we follow this line of thought, we emphasize that in complex digital platforms, facilitation and abstraction of E2E solutions is an antecedent rather than merely an outcome of generativity. Furthermore, our model suggests that abstracted solutions need to be fed back to the platform in the form of standardized modules for the overall platform ecosystem to flourish. Thus, we contribute to the discourse on resolving the tension between individual and collective value appropriation (Wareham et al. 2014).

Next steps. As illustrated in Table 1, the insights described in this paper are the results of the conceptual definition phase of our research project. The first interviews conducted at TelcoCorp (N=4) and the initial insights from the literature informed the transfer of the general theory to the domain of IIoT platform ecosystems. The result was our initial model, intended to serve as prescriptive knowledge regarding how to stimulate generativity in IIoT platform ecosystems. However, our initial interviews were primarily of exploratory nature, generating descriptive knowledge as to how our theoretical deliberations relate to a real-world IIoT platform ecosystem. Currently, we are conducting further semi-structured interviews with managers of TelcoCorp in different positions. In our elaboration phase, we will then iterate between theory and empirical evidence, thereby using the tactics of contrasting, specification, and structuring proposed by Fisher and Aguinis (2017) for theory advancement. This will allow us to see if the model is indeed suited to drive generativity, serving as prescriptive knowledge, or needs further refinement. However, data collection will not be restricted to the platform owner, but also include peripheral actors such as complementors and customers that have largely been neglected in research so far (Schreieck et al. 2016). We hope that this approach will provide valuable insights into further unknown governance mechanisms (e.g. structures to reduce coordination efforts in E2E IIoT projects) and may help to expand the scholarly discussion from a static consideration of well-known trade-offs in platform research (e.g. control vs. generativity) to a more dynamic one (Wareham et al. 2014).

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