Control versus Generativity: A Complex Adaptive Systems Perspective on Service Platforms

Research-in-Progress

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Abstract

Service platforms emerge as a dominant strategy for generating innovations. In this paper we argue that leveraging innovations on service platforms requires a careful trade-off between stimulating and controlling generativity. In order to gain a richer understanding of this duality we distill literature on generativity across disciplines. Our review yields two mechanisms for controlling generativity, architectural and relational control. We argue that conceptualizing service platforms as complex adaptive systems allows us to explain the impacts of both control mechanisms on the platform’s generativity. In order to observe control impacts we motivate a longitudinal methodological perspective and present first results of an empirical study at a large multinational service platform vendor. The final results of this study are expected to contribute to extant literature on service platforms and complex adaptive systems, as well as to provide valuable insights for decision makers in the field.

Keywords: Generativity, service platforms, control, complex adaptive systems.
Introduction

In the past years, the nature of service innovation has undergone considerable change: It has become more open, collaborative, and complex by emphasizing networks and ecosystems of partners (Breidbach et al. 2013; Chesbrough 2003; Lusch and Nambisan forthcoming; Nambisan 2013). This trend is pervasive in information technology (IT) firms (e.g. SAP, Microsoft), which increasingly leverage service platforms to co-create value (Lusch and Nambisan forthcoming). Platforms represent software-based systems that offer core functionality that can be used, recombined, and extended by a global network of partner firms (Tiwana et al. 2010). Platforms seek to leverage the expertise of a diverse partner community with skills and an understanding of customer domains that platform vendors do originally not possess, thus aligning better with the needs of heterogeneous adopters (Ceccagnoli et al. 2012; Frels et al. 2003) and harnessing indirect network effects (Katz and Shapiro 1994). Unlike traditional software development, platforms serve as operant resource (Lusch and Nambisan forthcoming) to generate a wide variety of application software on an unprecedented scale (Boudreau 2012; Tilson et al. 2010; Yoo et al. 2010).

Generativity, in terms of “a technology’s overall capacity to produce unprompted change driven by large, varied, and uncoordinated audiences” (Zittrain 2006, p. 1980), has been attributed a platform’s key source of value (Yoo et al. 2010). In the case of SAP, more than 8,000 organizations worldwide co-create value based on its core enterprise system, ranging from oil rig management systems to payroll solutions for Icelandic fisherman. These complements address heterogeneous customer needs and thereby extend the overall value of the platform (Wareham et al. 2014). A platform’s generativity is important, because it reflects its ability to generate new and unforeseen outcomes that may address current or prospective needs of its adopters (Frels et al. 2003; Henfridsson and Bygstad 2013).

However, generativity does not automatically translate into positive outcomes. It can also lead to fragmented and too varied platforms, thus becoming less useful for both customers and partners, thereby reducing the incentives of both customers and partners to adopt to the platform (Boudreau 2012; Cusumano and Gawer 2002; Katz and Shapiro 1994). Therefore, vendors switch from passively catalyzing generativity (Ghazawneh and Henfridsson 2013; Wareham et al. 2014) to stricter control (Iansiti and Lakhani 2009; Sarker et al. 2012). For instance, enterprise platform vendor SAP regularly stepped into intensive relationships with particular partners in order to more closely coordinate value co-creation or to grant a focal partner exclusive distribution rights for key customers (Iansiti and Lakhani 2009). Despite stricter control may suggest the ability to capture more value from deeper synergies (Das and Teng 2000), prior research has argued that too much control may alienate the role of partners (Boudreau 2010, 2012). Vendors face a delicate trade-off between stimulating generativity and exerting control (Boudreau 2010, 2012; Cardinal 2001; Tiwana et al. 2010; Yoo 2013). Understanding this balance is important, since more knowledge about how control impacts a platform’s generativity is highly valuable for IT professionals confronted by the complexity of managing them. Therefore, we strive to examine the research question: How does control impact the generativity of platforms?

Despite calls for investigating generativity (Yoo et al. 2010), only limited research has focused on its concept and, in particular, on the role of platforms as innovation triggers (Nambisan 2013; Wareham et al. 2014). This study attempts to contribute to IS research by analyzing the impacts of a vendor that pro-actively exerts control over a platform. We adopt a service-dominant logic (Vargo and Lusch 2004) and argue that service platforms serve as a venue for innovation that requires careful balance between generativity and control (Lusch and Nambisan forthcoming). In particular, we seek to extend the theoretical concepts of complex adaptive systems (CAS; Holland 1992) in IS research by investigating the impacts of micro-level control on macro-level outcomes. While CAS has attracted particular interest in our field (e.g. Merali and McKelvey 2006; Merali 2006), scholars also argue that the concept of CAS oversimplifies (Curseu 2006). Indeed, the role of CAS control, in terms of “balancing what needs to be controlled against what may be allowed to emerge” (Vessey and Ward 2013, p. 307) remains ambiguous (Merali and McKelvey 2006).

This research-in-progress paper proceeds as follows. First, we discuss background literature on generativity and highlight the trade-off between its stimulation and control. Second, we argue why CAS concepts offer insights into the theoretical problem. Subsequently, we present our research setting and lay
the methodological foundation. Preliminary results are presented and discussed as well as an outlook of our research project exemplified.

**Background Literature**

**The Role of Service Platform Generativity**

Generating innovations has moved from the locus of one organization to multiple loci; spanning a diverse global network of contributors, while rendering IT as a critical enabler of innovation and innovation ecosystems (Dougherty and Dunne 2011; Selander et al. 2013). Innovation now centers around networks of innovators, is information-based in nature, and has shifted toward the value that it creates (Breidbach et al. 2013; Lusch and Nambisan forthcoming; Nambisan 2013). This pattern, observable in many industries, is gaining prominence in IT firms, which build on complex and dynamic service platforms for value creation and innovation (e.g. Ceccagnoli et al. 2012; Cusumano and Gawer 2002; Lusch and Nambisan forthcoming; Tiwana et al. 2010). In particular, we refer to platforms as the “extensible core of a software-based system that provides core functionality shared by the modules that interoperate with it and the interfaces through which they interoperate” (Tiwana et al. 2010, p. 675). Independent software firms, hereafter partners, build on the platform’s core functionality and extend it by developing functionality-adding modules (Cusumano and Gawer 2002).

Platforms, unlike traditional software systems, are designed for generativity: they seek to leverage the expertise of outside firms – with skills and an understanding of customer needs which the platform vendor may not possess – to creatively develop innovations unexpected by the platform vendor (Nambisan 2013; Tilson et al. 2010; Wareham et al. 2014). We refer to this attribute as generativity, capturing “a technology’s overall capacity to produce unprompted change driven by large, varied, and uncoordinated audiences”. Generativity reflects a system’s capability to allow for a recombination of its elements and to assemble, extend, and redistribute its functionality (Tilson et al. 2010). Generativity has been attributed the key source of value of platforms (Yoo 2013), because it, if effectively leveraged, relates to outcomes as evolution (Henfridsson and Bygstad 2013), innovation performance (Tilson et al. 2010), and partner engagement (Brodie et al. 2011). Generativity is important, because it may create formidable competitive barriers for rival platforms (Katz and Shaprio 1994; Parker and Van Alstyne 2005).

Table 1 provides an overview of research papers that focus on generativity and were published in the top IS outlets. Generativity has been examined on both individual and organizational levels. Individuals are attributed generative capacity, referring to their ability to challenge the status quo and produce something ingenious or at least new in a particular context (Avital and Te’eni 2009). Organization scientists have investigated generative capabilities, that is, capabilities that generate other capabilities (Makadok 2001). In semiotics and epistemology generativity is associated with the ability to construct complex messages from a finite set of entities and grammars (Lee et al. 2008).

Generativity emanates from both a platform’s architecture and the organizational relationships it spans. Architectural sources gather around the composition, re-configurability, and interaction of a platform’s core components (Henderson and Clark 1990; Tilson et al. 2010), serving as an “engine of innovation” (Boland et al. 2007, p. 633). Architecture-induced generativity is leveraged by the availability of standardized interfaces and unbounded systemic features (Henderson and Clark 1990; Henfridsson and Bygstad 2013; Um et al. 2013). Others took a more holistic stance and argued that the design of an architecture enables an effective distribution of actors that work on it (Kim and Kogut 1996; Yoo 2013). First empirical evidence indicates that unbounded systemic features may be responsible for causing generativity to unpredictably emerge (Um et al. 2013). Moreover, generativity has been conceptualized to emerge from relational sources reflecting large parts of the literature on alliances (e.g. Das and Teng 2000; Powell et al. 1996). Thereby, scholars have argued from different perspectives, e.g. relational investments (Dyer and Singh 1998) or collective strength (Das and Teng 2000). Others highlighted the importance of relational intensities, arguing that more intensive ties between vendor and partner allow to generate products and services with substantially more value potential (Sarker et al. 2012).

What crystallized in this review is the notion of a paradoxical nature of generativity (Boudreau 2010; Tilson et al. 2010; Yoo 2013). Generative systems are attributed a high degree of equivocality and serendipity (Zittrain 2006) whilst it has been acknowledged that generativity does not automatically
result in desired or valuable outcomes (Kallinikos et al. 2013). Instead, generativity highlights the consideration of controlling change, appropriation, and critical resources (Tilson et al. 2010). In the following, we will shed light on this issue.

### Table 1. Generativity in IS research

<table>
<thead>
<tr>
<th>Reference</th>
<th>Outlet</th>
<th>Contributions relevant for this research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avital and Te‘eni (2009)</td>
<td>ISJ</td>
<td>- Explore the underpinnings of an individual’s generative capacity as a source of innovation and the appropriate importance of generative fit in the design of IS</td>
</tr>
<tr>
<td>Gaskin et al. (2014)</td>
<td>MISQ</td>
<td>- Describe sociomaterial routines as being comprised of social and material elements that are inherently generative</td>
</tr>
<tr>
<td>Henfridsson and Bygstad (2013)</td>
<td>MISQ</td>
<td>- Propose a configurational perspective on generative mechanisms in digital infrastructure revolution and their influence on evolution outcomes</td>
</tr>
<tr>
<td>Kallinikos et al. (2013)</td>
<td>MISQ</td>
<td>- Argues that the generativity of digital artifacts causes ambivalent ontology, i.e. that digital artifacts are constantly changing, evolving, and are embedded into webs of technical and organizational relations</td>
</tr>
<tr>
<td>Lee et al. (2008)</td>
<td>MISQ</td>
<td>- “Lego-like” structures of digital technologies make the space of resulting possibilities increasingly complex and methods for representing this complexity must be of interest</td>
</tr>
<tr>
<td>Tilson et al. (2010)</td>
<td>ISR</td>
<td>- Reasons that generative designs allow individuals and organizations to co-create services, applications, and content, thereby enabling new business models and sheer variety, while increasing the criticality of appropriate coordination</td>
</tr>
<tr>
<td>Um et al. (2013)</td>
<td>ICIS</td>
<td>- APIs form a complex and dynamic ecosystem resulting in generative distributions that are distinct from known patterns</td>
</tr>
<tr>
<td>Yoo (2013)</td>
<td>JAIS</td>
<td>- Argues that generativity emerges from the characteristics of digital technology and offers competitive advantages that modularity alone cannot offer</td>
</tr>
</tbody>
</table>

### Balancing Platforms between Generativity and Control

Controlling generativity has become a highly prevalent issue (Boudreau 2010; Ghazawneh and Henfridsson 2013; Pagani 2013; Tilson et al. 2010). Indeed, generativity may not automatically result in positive outcomes (Yoo 2013), but may result in fragmented and too varied platforms, thus reducing the incentives of both customers and partners to invest or engage in the platform (Boudreau 2010; Brodie et al. 2011; Katz and Shapiro 1994). In contrast to large parts of the literature on control (Kirsch 1997), the relationships between vendor and partners are not classical principal-agent relationships (Tiwana et al. 2010). Therefore, control takes the form of coordination rather than mitigating agency hazards (Tiwana et al. 2010). Vendors use control mechanisms to make the attainment of their goals more predictable, which ensures more certain outcomes, and in this sense help generate positive outcomes (Das and Teng 1998). More formally, we refer to control mechanisms as any process by which a vendor directs attention, motivates, encourages, and enforces partners to act in desired ways to meet the vendor’s objectives (according to Cardinal 2001). In an effort to understand the influence of control mechanisms on platform generativity, we reviewed the literature (following Webster and Watson 2002) on technology-based alliances, studies focusing on software development, and collaborative creation of value. We distilled two relevant categories of control mechanisms:

**Relational control.** Exercising relational control refers to situations in which vendors step into a customized relationship with a focal partner with the aim of exerting control (Das and Teng 1998; Iansiti and Lakhani 2009). Relational control is applied to influence the value co-creation with a partner (Kirsch
et al. 2002). A vendor may directly influence the methods, procedures, and resources a partner employs during the development process (Tiwana 2008). For instance, vendors step into dyadic relationships with partners in order to better align its resources with the domain knowledge of the focal partner (e.g. Sarker et al. 2012). This form of relational modification may enable effective coordination, negotiation, and bargaining (Das and Teng 2000). Or else, vendors may be forced to step into more intensive partnerships to ensure the further development or ongoing support of the product or service (Iansiti and Lakhani 2009).

Architectural control. Using architectural control, platform vendors shape the interactions of partners with the platform's core by managing and defining the interfaces between them (Baldwin and Woodard 2008). Architectural control is distinct from relational control in that it primarily targets the platform's functionality rather than particular relationships to partners (Tiwana 2008). Architectural control leverages changes in the platform's modularity, decomposition, and design rules to exert influence (Tiwana et al. 2010). Prior research has emphasized the role of architecture as "embedded coordination" (Sanchez and Mahoney 1996, p. 64), which may increase the flexibility of platform vendors to respond to changes in their environment. Architectural control may lower the need for relational control (Tiwana 2008). Recent empirical evidence highlights that architectural control may serve complementary to relational control, but with the advantage of being highly scalable across the platform (Claussen et al. 2013).

A vendor that exercises too much control over the platform runs the risk of alienating the partners' role by strengthening the boundaries for innovation (Boudreau 2012; Yoo et al. 2012). Scholars emphasized that the coordination of platforms “must be designed to manage the delicate balance of generativity and control” (Yoo et al. 2012, p. 1400) or framing a trade-off between “diversity versus control” (Boudreau 2010, p. 1851). Others focused on the concept of openness; opening a platform eases the restrictions on developing for a platform, thus stimulating partners to contribute (Boudreau 2010, 2012; Tiwana et al. 2010). Thereby, the concept of boundary resources is gaining momentum (Ghazawneh and Henfridsson 2013). Despite its importance, no research has yet developed a comprehensive understanding of how control mechanisms impact a platform's generativity. On the one hand, a theoretical investigation of this phenomenon is hardened by the inherent heterogeneity, complexity, and non-linearity of platform ecosystems (Um et al. 2013). On the other hand, the concept of generativity is difficult to grasp, because it emerges through “uncoordinated interactions among distributed and heterogeneous actors” (Yoo 2013, p. 230) and its outcome largely remains “unchartered and unknown” (Boudreau 2012, p. 4). In the following, we exemplify how the theoretical concepts of CAS provide insights into these issues.

Theoretical Considerations and the Lens of Complex Adaptive Systems

The identified characteristics of generativity do also represent requirements for an appropriate theoretical investigation. On the one hand, an adequate lens needs to address the cross-level nature of generativity (Burton-Jones and Gallivan 2007) and, on the other hand, its collective level outcome. Moreover, these interactions need to be analyzable without abstracting away interactions or interdependencies. These interactions capture the service system (Spohrer and Maglio 2008) in terms of both technological, i.e. the platform as operant resource, and organizational entities, i.e. partners or customers.

In this paper, we employ the tenets of complex adaptive systems to enrich our theoretical understanding of generativity. The concept of CAS (Holland 1992) has drawn particular attention of researchers in our field (e.g. Madden et al. 2012; Merali and McKelvey 2006; Merali 2006; Nan 2011). Merali (2006, p. 224) refers to CAS as “open, non-linear dynamical system that adapts and evolves in the process of interacting with its environment”. In CAS, aggregate structures arise not from a central authority, but from the interactions among interdependent agents, who pursue individual goals based on local knowledge and feedback loops (Holland 1992; Nan 2011). CAS theory itself does not refer to a stand-alone scientific paradigm, but rather serves as a label for concepts and constructs addressing non-linear systems and disequilibrium (Merali 2006). It provides a framework that promotes formal modeling and allows new concepts to be developed (Morel and Ramanujam, 1999).

Yet there is no universal perspective, which describes CAS in its entirety, most research narrows its core to the following constituting elements: agents, interactions, and the environment (Nair et al. 2009). Agents represent the basic entities of actions in CAS. They may take the form of human beings, organizations or objects. Resources are objects, such as physical goods or information. Interactions represent the
behavioral action of agents and capture the mutually adoptive behavior of agents (Drazin and Sandelands 1992). Interactions are processed by agents and may involve the use of resources (Merali 2006). The *environment* represents the medium for all agents to interact within (Holland 1996). CAS conceptualizes that agents, interactions, and the environment collaboratively create observations at the macroscopic level.

**Conceptualizing and Extending a CAS Model of Platform Generativity**

We model platform generativity as an emergent structure that emanates from interactions of agents, the relationships between agents, and the environment (depicted in Figure 1). Following our argumentation, we conceptualize partners as agents and the platform’s core as resources. Partners interact with the platform’s core by using, recombining, and extending its functionality. These interactions shape the emergence of generativity at the macroscopic level (Figure 1-1). The platform vendor is modeled as an entity external to the CAS that intervenes in the ecosystem by either exerting control over the platform (Figure 1-2A), i.e. the resources, or the relationship to a particular partner, i.e. the agents (Figure 1-2B). We argue that exerted control impacts generativity, i.e. the emergent structures (Figure 1-3).

![Figure 1. A complex adaptive systems perspective on platform generativity](image)

Modeling platform generativity as a CAS allows us to address important theoretical aspects. First, the CAS model maps the contribution of interactions between partners and the platform core to generativity. Consistent with the nature of generativity, the proposed model does not assume a centralized control or coordination mechanism for the organized behavior of the platform. Instead, it helps us to explore how decentralized interactions among heterogeneous partners with the platform core lead to generativity. This is particularly relevant as prior research has noted that ecosystems are socio-technical constructs, where technological artifacts and organizations are intertwined into a net of heterogeneous and hardly predictable relationships (Vidgen and Wang 2006).

The CAS model integrates a platform's technological underpinnings into theory development. By doing so we address the call to more deeply investigate the role of technology that underpins platform relationships (Nambisan 2013; Tiwana et al. 2010). Second, the concept of CAS allows us to investigate the emergence of generativity on two levels. On the micro level, interactions between partners and the platform take place, whilst transforming into generativity on the macro level. Thus, we depart from the understanding...
of generativity as a linear function of several inputs. Instead, this distinction enables an analytically separated investigation of the micro and macro levels. Third, the CAS model allows us to follow and track the platform’s dynamics and evolution over time (cf. Benbya and McKelvey 2006). Indeed, large parts of the IS literature have taken an outcome-focused stance, neglecting how systems evolve over time (Orlikowski and Iacono 2001; Schilling 2000). However, a platform’s evolutionary trajectories are jointly determined by its technological underpinnings and its organizing principles (Tiwana et al. 2010), thus necessitating a perspective that addresses these dynamics.

However, research has also outlined limitations of CAS theory that are important to discuss at this point. First, researchers have noted that the effects of interactions on the micro level on the emergence at the macro level remains ambiguous (Benbya and McKelvey 2006; Merali 2006; Tanriverdi et al. 2010; Vessey and Ward 2013). The interplay between both levels, also in terms of the existence of a certain deductive relationship, remains unaddressed. Second, our understanding of the role of coordinating CAS, in terms of “balancing what needs to be controlled against what may be allowed to emerge” (Vessey and Ward 2013, p. 307), remains vague. Despite its notion as a paradox of being “in control and not in control” (Vidgen and Wang 2006, p. 270), no attempt was made to address this trade-off (Merali and McKelvey 2006; Merali 2006). In conceptualization of platform generativity, we model two broad categories of control mechanisms. However, CAS theory does not make assertions of control mechanisms or how these mechanisms influence the emergence on a system level. From a practical point of view, our research addresses these issues by investigating how platform control results in changes in the emergence of generativity. We seek to improve our understanding of the trade-off between generativity and control. From a theoretical perspective, we aim at extending CAS theory by the concept of control. In the following we will point out, how our research intends to shed light on these issues.

Context and Methodological Overview

Methodology. The constantly changing nature of platforms requires the use of an adequate methodological toolset (El Sawy et al. 2010; Tanriverdi et al. 2010). The evolving nature of platforms has been outlined as a key methodological issue (Tilson et al. 2010). Prior research in IS seems to have focused on outcomes, rather than understanding how systems evolve over time (Orlikowski and Iacono 2001). In our study, no single perspective, however manifold the observations from that one point, would reveal the entire pattern of how control impacts a platform’s generativity (Leonard-Barton 1990). In order to understand the interacting factors, it is necessary that our research methodology captures these effects both over time and among different entities. Indeed, a longitudinal, real-time case study can increase the internal validity of the results obtained and enables us to understand these dynamics (Leonard-Barton 1990; Orlikowski and Iacono 2001; Yin 2008). Qualitative research is well-suited for exploring new theoretical relationships as in our study (Eisenhardt 1989; Yin 2008). Moreover, prior research seems to have solely focused to use CAS as means for supporting conceptual modeling (e.g. Allen and Varga 2006; Benbya and McKelvey 2006; Madden et al. 2012) or as a basis for setting up agent-based simulations (e.g. Curseu 2006; Nan 2011).

Data Collection and Analysis. The software vendor AlphaCorp and its service ecosystem serves as the empirical context for this study. AlphaCorp is a multi-national corporation that offers enterprise systems primarily suitable for large organizations, but also offers trimmed versions for small and medium-sized businesses. Large parts of AlphaCorp’s revenue stem from its enterprise resource planning system. A three-digit number of partners co-creates value based on AlphaCorp’s platforms. These partners are critical to AlphaCorp’s business model and serve as AlphaCorp’s link to various clients and industry niches. In the past years, AlphaCorp has embarked on the platform strategy and spent tremendous effort with refining standardized architectural and relational boundaries for the cooperation with its partners. Before, AlphaCorp had not been a stranger to software partnerships. However, prior partnerships were focused on projects, which not seldom resulted in AlphaCorp acquiring the partner. Despite AlphaCorp’s efforts for launching a standardized, low-touch partner program, in terms of allowing external contributors to develop for AlphaCorp’s platform without any intensive interaction with AlphaCorp, the dyadic-focused thinking seems still prevalent in AlphaCorp’s decision-making. We see AlphaCorp as exemplary, because it is among the most successful vendors of enterprise systems globally, where its success, in part, can be attributed to the generative capabilities of its platform.
This study seeks to emphasize a methodological pluralism when using CAS theory by investigating it from a longitudinal qualitative facet. Prior research has largely relied on agent-based simulations (e.g. Curseu 2006; Nan 2011) or the application of fitness models (e.g. Vidgen and Wang 2006). Adopting a qualitative approach allows us to investigate micro level and macro level separately and to discover the linkage between control on the micro level and its impact on the system’s macroscopic observations in more detail. Therefore, we follow AlphaCorp’s platform activities on a longitudinal scale, envisaged to span a two year period. This longitudinal study involves a series of multiple interviews over the time period in three month intervals. So far, we have conducted 20 semi-structured interviews (Yin 2008); each with a chief executive of AlphaCorp’s partners that hold the responsibility for the relationship to AlphaCorp. Each of the interviews lasted about 60 minutes and covered nine open questions designed to collect qualitative data. In order to increase validity, we complement the partner perspective by interviewing the respective partner managers at vendor side. We also are also in the process of accessing complementary quantitative data, including sales figures, download statistics, and innovation rates. This allows us to incorporate the effects of exerted control on customers.

We used MAXQDA to code each interview with regards to the identified control mechanisms and impacts on generativity. We aim to use these interviews to get an understanding of the particular partner’s business model, its participation in the platform ecosystem, and how AlphaCorp’s exerted control over the platform’s architecture and the relationship impacts the partner. Mapping these interactions in our CAS model, we seek to uncover important insights into how micro-level control impacts macro-level emergence. Over time, we aim to get fundamental insights how the platform evolved over time and how exerted control shaped the platform’s generativity.

### Preliminary Results

Our preliminary results focus on illustrating the cases of four partner firms, i.e. P1, …, P4, which we consider as particularly insightful (see Table 2). Regarding these partners we analyzed interviews we conducted with their chief executive. In particular, P1 provides specialized solutions for a subset of AlphaCorp’s customers in the retail industry. P1, which has been a partner of AlphaCorp for more than a decade, is concerned about AlphaCorp’s control. In contrast to its observations, P1 had expected a more passive role of AlphaCorp in terms of a catalyzing entity in the background of the ecosystem (see excerpt A).

P2 provides a smaller number of AlphaCorp’s customer with a highly specialized module, which interconnects AlphaCorp’s platform with ecosystem-external web services. More recently, P2 had focused on the development of a module for signing digital documents with an electronic signature, thereby making these documents legally binding. After the module’s release, P2 was contacted by AlphaCorp with the request to remove the module from its offering, because the new service functionally overlapped with the offerings of a key cooperation partner of AlphaCorp. After this encounter, P2 removed the module from its portfolio and decided for a reconsideration of its future relationship to AlphaCorp (see excerpts B, C).

P3 began to partner with AlphaCorp more than 20 years ago and kept continuously adjusting its business model to AlphaCorp’s strategic visions. In particular, P3 encountered several situations, in which AlphaCorp’s changes on the platform itself resulted in the incompatibility of its products (see excerpt D). Although not involved in a similar case like P2, P3 sees a long-term issue of relational control for the platform’s generativity (see excerpt F).

P4 is a more recent partner and offers modules that interface common spreadsheet software with AlphaCorp’s platform. One of P4’s major value offerings represents a module that allows to transfer journals and budgets into AlphaCorp’s platform. Despite the module is used widely by customers AlphaCorp has not yet offered a comparable functionality. With the new release of AlphaCorp’s platform partner P4’s solution has become obsolete, which results in business disruptions for P4 (see excerpt F).
Generativity vs. Control in Service Platforms

Interview excerpt Impact

| A | “We expect AlphaCorp to keep open spaces for the companies like we are. [...] And we expect AlphaCorp to protect our rights as well. This is really important for us.” (P1_CEO) | Relational Control → Partners |
| B | “For example, AlphaCorp contacted us with ‘you develop this add-on but already another partner developed this add-on. Please close this add-on, we will not respect this’.” (P2_CEO) | Relational Control → Niche |
| C | “For example, a larger organization, which has a deeper relationship to AlphaCorp […], can say ‘okay we actually have a similar service, […] please change your module [P2 module].’” (P2_CEO) | Architectural Control → Partners |
| D | “This change confronted us with the need to transfer our add-on to the new technology, which was however not fully satisfying the needs.” (P3_CEO) | Architectural Control → Partners |
| E | “For example, I read in the information for [AlphaCorp’s platform] that there’s - there will be functionality to import data directly from Excel. For me, that’s an important thing because that’s what some of my tools does. So I need to make strategic decisions as to, is that something that kills my product and should I stop developing or is it something that I could piggyback on and enhance further.” (P4_CEO) | Relational Control → Partners |
| F | “The case is, this may be a benefit for AlphaCorp for the first years. But in the long term, we believe that standard partners like us will actually be eliminated. And this will actually kick AlphaCorp in the back according to the other clients and companies as well.” (P3_CEO) | Relational Control → Generativity |

Table 2. Exemplary preliminary results

Discussion and Outlook

We see a number of interesting insights in the preliminary results. First, our preliminary findings encouraged us in pursuing our CAS perspective on platform generativity. In particular, partners P1, P2, and P3 recognize impacts of AlphaCorp’s exerted control on their relationship to AlphaCorp, the niche they are covering with their services, and the platform’s generativity. A potential future avenue may build around a niche-based view on platform generativity. Indeed, our findings suggest that relational control is perceived by non-focal partners as a threat for their business model. P2 observed that relational control resulted in reduced competition in the niche that was formerly covered by several partners. Our preliminary results indicate that the generativity of this niche is reduced by exerted control. This may allow to draw inferences about a niche-based view on CAS, where each niche itself transforms when being controlled, which may or may not impact the platform’s overall generativity.

Currently, we are in the process of conducting further interviews with AlphaCorp’s partners. In parallel, we also have access to the vendor side and plan to interview the respective dyadic partner managers in cases where AlphaCorp exerted control. The developed CAS model is used to guide the empirical investigation that we are currently conducting. In particular, we seek to (1) uncover and explain the impacts of micro level control on macro level emergence, and to (2) explore the role of control mechanisms in CAS. Even though the role of architectural control has been addressed in research commentaries (e.g. Tiwana et al. 2010; Yoo 2013), no research has yet empirically investigated its use. From a theoretical point of view, we expect our study to contribute to the discourse on CAS by providing deeper insight in how to control the outcomes of such systems. In addition, to the best of our knowledge, our study is the first to explore the concepts of CAS theory in a longitudinal setting. In doing so, we expect to extend the methodological toolkit around CAS theory. From a practical point of view, we aim at providing guidance regarding the delicate balance between stimulating generativity and exerting control. We expect that our research sheds light on the complex nature of generativity and its evolvement over time.
References


