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THE INTERPLAY OF POWER AND TRUST IN PLATFORM ECOSYSTEMS OF THE ENTERPRISE APPLICATION SOFTWARE INDUSTRY

Complete Research

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Abstract

In recent years, the formerly oligopolistic Enterprise Application Software (EAS) industry began to disintegrate into focal inter-firm networks with one huge, powerful, and multi-national platform vendor as the center, surrounded by hundreds or even thousands of small, niche players that act as complementors. From a theoretical point of view, these platform ecosystems may be governed by two organizing principles - trust and power. However, it is neither from a practical nor from a theoretical perspective clear, how trust and power relate to each other, i.e. whether they act as complements or substitutes. This study tries to elaborate our understanding of the relationship of trust and power by exploring their interplay using multi-dimensional conceptualizations of trust and power, and by investigating potential dynamics in this interplay over the course of a partnership. Based on an exploratory multiple-case study of seven dyadic partnerships between four platform vendors, and seven complementors, we find six different patterns of how trust and power interact over time. These patterns bear important implications for the successful management of partnerships between platform vendors and complementors, and clarify the theoretical debate surrounding the relationship of trust and power.

Keywords: Power, Trust, Platform Ecosystems, Interplay

1 Introduction

In the development of software, inter-organizational networks have continuously gained in importance. Today, users of Android-powered smartphones, tablet computers, or notebooks, for instance, can access almost 900,000 applications, provided by third-party developers on Google Play, Google's application store. But in spite of this vast number of applications, the market's actual growth rate is even more impressive. Established in fall 2008, Google Play already offered 200'000 applications as of early 2011, and has continued to increase its growth rate until today (AppBrain, 2013, De Vere, 2012). This representative example arrestingly illustrates the increasing importance of the international division of labor across the limits of one single organization in the field of information and communication technology (ICT) (Gawer, 2009). Yet, this trend towards inter-organizational networks, has not just altered the smartphone, but also the enterprise application software (EAS) industry (Messerschmitt and Szyperski, 2003, Sarker et al., 2012, Tiwana et al., 2010). In other words, today dominant system vendors, often referred to as hubs or platform vendors (Jarillo, 1988, Messerschmitt and Szyperski, 2003) moved from being integrated-systems suppliers to being providers of underlying platforms. These platforms, together with their interfaces, build the foundation for complementary applications provided by a plethora of smaller software companies, often referred to as spokes or complementors (Tiwana et al., 2010). Together, a platform and its complementors form a loosely-coupled (Orton and Weick, 1990), inter-firm network called a platform ecosystem (Jansen et al., 2013), illustrated in Figure 1.

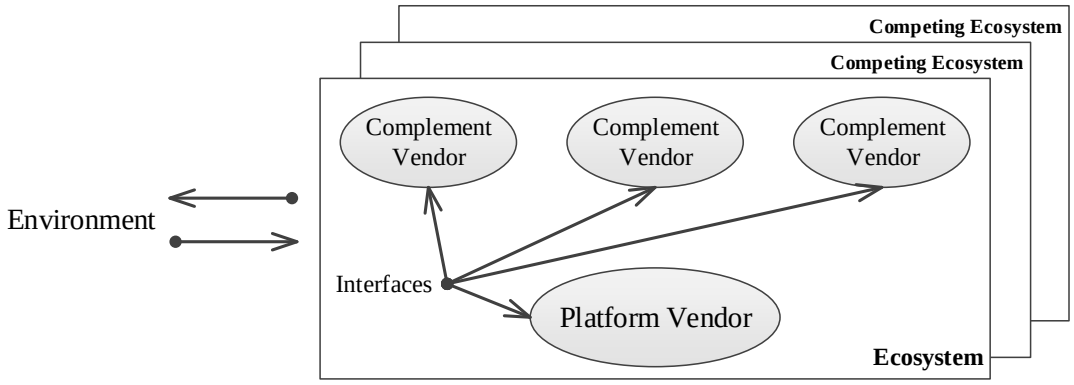

Figure 1: Elements of platform ecosystems in the EAS industry based on Tiwana et al. (2010)

In contrast to other types of inter-organizational cooperation, collaboration in these platform ecosystems is based on neither capital nor joint effort in a specific project or business area. Instead, collaboration is based on general agreements and certifications of the complementors' products, resources, or capabilities (Huber et al., 2010, Kude et al., 2012, Vitharana, 2003). What is more: Platform ecosystems differ from traditional inter-organizational cooperation (networks) through substantial resource asymmetries and unilateral dependence (Ceccagnoli et al., 2012, Huber et al., 2010, Kude et al., 2012, Sarker et al., 2012, Vitharana, 2003). Hence, compared with complementors, platform vendors are large multinational software providers that possess superior material, technological, economic and informational resources (Ceccagnoli et al., 2012, Huang et al., 2013). In other words, while complementors as collaborators unilaterally depend on these superior resources, platform vendors rather aim at creating positive network effects for their platform by motivating as many small niche players as possible to become complementors (Gao and Iyer, 2006, Kude et al., 2012, Sarker et al., 2012). Platform vendors therefore depend on their network of complementors, while complementors depend on the resources provided by the respective platform vendor.

This twofold asymmetry of resources and inter-dependence creates uncertainty which, from a theoretical point of view, can be overcome through two organizing principles: On the one hand, the unilaterally dependent complementor could make a "leap of faith" (Möllering, 2006, p. 106) by accepting its vulnerability, i.e., the complementor may *trust* the platform vendor to not take advantages of its vulnerability (Mayer et al., 1995, Rousseau et al., 1998), and on the other hand, a platform vendor could utilize its superior attributes to force the complementor to act according to the platform vendor's will, i.e., the platform vendor could exert *power* (Bachmann, 2001).

While prior research on inter-organizational collaboration almost exclusively investigated the role of trust, the role of power within the context of platform ecosystems has rarely been investigated (cf. Bachmann, 2001, Hart and Saunders, 1997, Hart and Saunders, 1998, Jasperson et al., 2002). Moreover, given the unique twofold asymmetry mentioned above, both trust and power may be of major importance in the context of platform ecosystems and therefore investigating both could deepen our understanding of how this novel type of inter-organizational collaboration may be effectively managed. In addition, such a study of both trust and power might be not only topically but also theoretically appealing because trust and power are not necessarily mutually exclusive. In fact, there is a wider theoretical debate as to whether they act as complements or as substitutes (cf. Alvarez et al., 2003, Bachmann, 2001, Ireland and Webb, 2007, Lane and Bachmann, 1997, Molm, 1997). This prompted this study, which attempts to explore the following research question by analyzing seven dyadic partnerships between four different platform vendors and their respective complementors:

How do trust and power collude before and in relationships between complementors and platform vendors in the enterprise application software industry (EAS)?

This paper is organized as follows. First, we lay the theoretical foundations of this study by introducing the concepts of trust and power. Next, we show the controversy surrounding the relationship of trust and power. We then argue, following recent advances in both general management and IS literature (Huber

et al., 2013, Lewis, 2000), that this controversy could be clarified using multi-dimensional conceptualizations and by considering the role of time. Subsequently, the study's research design is described. The study's results are then presented and discussed.

2 Theoretical Foundation

2.1 Trust

In recent years the concept of trust heavily gained in importance as a fundamental explanation for business behavior in inter-organizational contexts (Janowicz and Noorderhaven, 2006). Trust is commonly regarded as the willingness to be vulnerable, based on the assessment of another's party's benevolence, competence and integrity (Mayer et al., 1995, Rousseau et al., 1998). Thus, instead safeguarding against risks, one party, the so called trustor, can make a "leap of faith" (Möllering, 2006, p. 106) by having confidence in another party, the so called trustee, to not take advantages of its vulnerability. While it is widely accepted that only individuals can place trust, this trust may be placed in a huge variety of objects (Janowicz and Noorderhaven, 2006). In platform ecosystems of the enterprise software industry boundary spanners act as single points of entry (Kude et al., 2012, Sarker et al., 2012). Therefore, we follow Janowicz and Noorderhaven (2006) who have proposed a trust conceptualization that acknowledges this paramount importance of boundary spanners Hence, in the context of platform ecosystems, two objects of trust are of paramount importance: If the object of trust is an individual, we may speak of inter-personal trust. If the object of trust is another organization, we may speak of inter-organizational trust. For instance, an employee of a complementor's organization may place his or her trust into the platform vendor's boundary spanner, responsible for managing the partnership with the respective complementors (Inter-personal trust). Alternatively, the same employee may also develop trust towards the platform vendor itself as a collective actor (Inter-organizational trust) (see Table 1).

		Who is trusted? (Trustee)	
		Individual	*Organization*
Who trusts? (Trustor)	*Individual*	**Individual → Individual** Inter-personal trust	**Individual → Organization** Inter-organizational Trust

Table 1: Conceptualizations of inter-organizational trust adapted from Janowicz and Noorderhaven (2006)

2.2 Power

According to Emerson (1962), power of actor A over actor B is the inverse of the dependence of actor B on actor A (Casciaro and Piskorski, 2005). In line with this general definition, French Jr. and Raven (1959) proposed a more fine-grained distinction between five sources of power, whereas each type derives from a different dependency. Consequently they argue that a company's dependency on another may be based on the other's degree of control over rewards, punishment, and coercion, as well as one's ability to impart and deploy legitimacy, attractiveness, and expertise (Forsyth, 2010). Reward and coercion are referred to as sources of direct power, whereas reference, expertise and legitimacy are referred to as indirect power. Table 3 gives an overview of the types of power along with an example code for each type.

Direct Power:		
	Definition:	**Example Codes:**
Reward Power:	The ability of one economic actor to control both personal and impersonal rewards (punishments) provided to the respective opposite (Forsyth, 2010).	- Hub defines criteria for access to / withdrawing of resources (knowledge, labor, or support). - Hub rewards spoke with material or immaterial benefits.

Coercive Power:	The ability of an economic actor to coerce the respective opposite who does not sufficiently comply with requests or demands (Forsyth, 2010).	- Hub defines mandatory requirements for an ecosystem participation. - Hub coerces spoke to comply with mandatory regulations for a further partner level ascent.
Indirect Power:		
	Definition:	**Example Codes:**
Referent Power:	The ability of an economic actor to influence the opposite parties based on their identification with, attraction to, or he respect for that economic actor (Forsyth, 2010).	- Based on a hub's market power (desirable reference) Spokes accept hub's interventions. - The by the spokes considered platform attractiveness on the market enables a hub to proactively intervene.
Expert Power:	The ability to influence an economic actor, based on the assumption that the opposite possesses superior skills, abilities, and/or information (Forsyth, 2010).	- The dependence of a spoke on the perceived / assumed competence, knowledge, or innovativeness of a hub, enables the hub to proactively influence the partnership.
Legitimate Power:	The socially sanctioned claim to a position or role that gives the occupant the ability to require and demand compliance with claimed directives (Forsyth, 2010).	- The perceived legitimacy allows the hub to act in a certain, otherwise inacceptable, manner. - Spoke considers hub to obtain superior attributes enabling the hub to proactively influence the partnership

Table 2: Direct and indirect sources of power

2.3 Exploring the Interplay of Power and Trust

In research there is a controversy about how trust and power are related to each other. In this context two opposing theoretical views have arisen. On the one hand, trust and power are considered as substitutes such that the exercise of power undermines trust and the existence of trust supersedes power. On the other hand, trust and power can be regarded as complements, i.e., exercising power can reduce uncertainty and therefore facilitates a leap of faith, while the existence of trust may ease the exertion of power (Bachmann, 2001). Besides these contradictory theoretical accounts, hardly any study, especially in the IS context, has given empirical insight into the relationship of trust and power in inter-organizational relationships; and none of them has studied this important issue in the context of platform ecosystems. In addition, the few empirical studies that have investigated the relationship of trust and power in inter-firm networks provide mixed empirical evidence (Hart and Saunders, 1997, Lane and Bachmann, 1997, Molm, 1997): While some studies rather support the substitutional view (Bachmann, 2001), others rather support the complementary view (Alvarez et al., 2003, Ireland and Webb, 2007).

In such situations of mixed empirical evidence for seemingly contradictory views, Lewis (2000) suggests to apply two strategies to elaborate empirical studies and as a consequence to clarify theoretical debates. First, researchers are advised to apply more fine-grained conceptualizations of key concepts (Lewis, 2000). We follow this advice by studying the interplay of the above mentioned five sources of power (reward, coercive, referent, expert, legitimate) with the two types of trust (inter-personal, inter-organizational). This procedure may enables a clarification of the debate of whether trust and power act as complements or as substitutes. For instance, while expert power and inter-personal trust may act as complements to each other, coercive power potentially undermines inter-organizational trust, and therefore acts as a substitute to trust. Second, Lewis (2000), suggests to consider the role of time. We follow this advice by studying the interplay of trust and power over the course of individual partnerships between platform vendors and complementors. This procedure may facilitates a clarification of the relationship between trust and power as they might act as complements at one point in time, whereas at a later point in time they may substitute each other (Huber et al., 2013). At the beginning of a partnership, for instance, the platform vendor might exert coercion by forcing the complementor to accept a standardized contract (i.e. it is the same contract for all complementors) that clearly defines the rules of the partnership. This may reduce uncertainty for the complementor, and eventually facilitates its decision to invest in trust (Bachmann, 2001). At a later point in time, however, the platform vendor possibly

detects that the complementor has violated the contract and subsequently exerts its contractually stipulated right to punish the complementor, which then reduces the complementor's trust towards the platform vendor. Thus, power may act as a complement at one point in time and as a substitute later on.

In sum, there is a lack of knowledge of how trust and power relate to each other. Consequently, we aim to provide theoretical and empirical elaboration of their complementary or substitutional relationship by studying the interplay of different types of trust and different types of power at different points in time.

3 Methodological Approach

3.1 Case Selection

To gather more compelling data, and simultaneously to obtain more robust results, we applied a multiple-case study design with seven dyadic partnerships in four globally leading EAS platform ecosystems (Yin, 2009). The selection of the four major multi-national EAS platform vendors, each maintaining a partner network of several thousand complementors all over the world, assured that the twofold asymmetry mentioned above was in fact of major importance in the partnerships. Each case then analyzes one particular, dyadic partnership between a platform vendor and a specific complementor, thus, the unit of analysis of this study is the partnership between complementors and platform vendors. To keep other factors, which were not of direct theoretical interest, stable, all investigated partnerships of our study are located in one country - Switzerland. Based on these selection criteria, interviewees and case companies were chosen through snowball sampling (Diekmann, 2009), i.e., higher-level managers from the platform vendors were asked to identify suitable complementor companies.

3.2 Data Collection

For each case we interviewed at least two key experts in hourly interviews on site, via Skype or telephone – for the platform vendor we interviewed the partner manager, and for the complementor we interviewed the employee responsible for managing the partnership with the respective platform vendor. Thus, for each partnership those individuals were interviewed who actually manage it. This interview data per case was supplemented with further information from line managers and technology professionals. In sum, this resulted in seventeen semi-structured interviews as delineated in Table 3.

		No. Interviews held		
		Spoke	Hub	
Platform Vendor A **HUB_A**	*BUSINESS* provides specific CRM, Case Management, and Anything Relationship Management solutions for HUB_A's platform	1	1	1
	LAYOUT is a Swiss provider of an Enterprise Document Creation tool that complements the office platform of HUB_A.	1	1	
Platform Vendor B **HUB_B**	*ENERGY* complements various platforms of HUB_B with a solution for trading and accounting energy, as well as for the management of international energy flows.	1	1	-
	INDIVIDUAL, as an erstwhile subsidiary of HUB_B, provides nowadays heavily individualized solutions for HUB_B's platforms.	1	1	
Platform Vendor C **HUB_C**	*BANKING* complements HUB_C's platform with a solution that extracts, transforms, analyses, and presents financial data of small and medium sized banks.	1	1	1
Platform Vendor D **HUB_D**	*COUNTER* provides a standard solution for HUB_D's platform that supports retailers in selling goods and services by handling the transaction recording and billing.	1	1	2

	AFFILIATE complements HUB_{D}'s platform with ERP solutions, specially tailored for subsidiaries of smaller and medium sized companies.	1		

Table 3: Platform Ecosystem

In addition to the interviews, and for triangulation reasons (Eisenhardt, 1989, Yin, 2009), we also analyzed relevant documents for each partnership, as for instance partnership contracts, codes of conduct, partnership charters, company websites, or annual reports.

3.3 Data Analysis

Based on the two sources of data, this paper follows Pettigrew's (1990) and Pentland's (1999) suggestions for an iterative process of data analysis and theory building (Miles et al., 2013). First, documents and interview transcripts were coded according to the constructs of our initial theoretical considerations, i.e. they were coded according to whether they express trust (inter-organizational, and inter-personal) or power (coercive, reward, expert, referent, and legitimate). Then, data was ordered by time and sequence such that the flow of events of each case was reconstructed. This flow of events was summarized in first case-write-ups. Then, data was systematically scanned for evidence on how trust and power interacted in each case. Subsequently, we systematically compared the interactions across all cases for similarities and differences. This phase of constantly comparing and integrating findings (Faems et al., 2008) allowed us to arrive at seven higher-level patterns – each of them describing a distinct interplay between different types of trust and different types of power. These patterns are presented in the next section.

4 Findings

In this section we present the findings of our exploratory multiple-case study. The structure of this section follows our initial theoretical considerations, i.e., we present findings on the interplay of trust and power. First, we show five patterns of how different types direct power (coercive, reward) interact with different types of trust (inter-organizational, inter-personal). Then, we present a pattern of how different types of indirect power (referent, expert, legitimate) interact with inter-organizational trust.

4.1 Direct Power and Trust

Pattern 1: Inter-organizational trust as necessary pre-condition for coercive and reward power

Our results show that over the course of a partnership between platform vendor and complementor different types of trust and different types of power interact in manifold ways. Yet, our results also point to the fact that different types of interactions systematically develop at different points in time.

An initial interaction usually takes place the moment partnership between platform vendor and complementor starts. Then, a complementor is faced with the decision of whether to accept or refuse the contractually given permission to apply coercive and reward power by a platform vendor. In other words, a platform vendor stipulates for example its right to force complementors to behave in a distinct manner in order to be eligible for desired benefits. Platform vendors usually manifest this ability in a standardized way, as it was confirmed in every ecosystem:

> In the scope of the partner network, partners have to sign standardized agreements. ($HUB_{A\text{-}BS2}$)
>
> Those standardized agreements are utterly important since, in the end, it matters money and legal consequences. ($HUB_{B\text{-}BS1}$)
>
> In general, every partner signs the standardized partner agreement. ($HUB_{C\text{-}BS1}$)
>
> An important contract, every partner has to sign, surely is the partner agreement. ($HUB_{D\text{-}BS1}$)

With those standardized agreements the platform vendors define the rules of the partnership in terms of what actions are considered as correct behavior. Interestingly, the platform vendor also stipulates the

right to reward complementors in cases of correct behavior, and to punish complementors when they act inappropriate. In other words, a complementor that is willing to partner, is forced to decide whether to accept these standardized rules or not:

> [HUB_B] would never accept to partner with a complementor without the complementor having signed agreements beforehand. ($INDIVIDUAL_{BS}$)

Interestingly, the complementors' decision of whether to enter or not a partnership with a platform vendor, and therefore the decision of whether to accept the "stick" of a standardized contract and potential punishments and the "carrot" of future rewards, hinges on the trust the complementor places in the platform vendor. For instance, ENERGY's "most important reason" ($ENGERGY_{BS}$) to join an ecosystem was that they trusted HUB_B's technology and that they were confident about HUB_B's integrity: "we were well aware of what [HUB_B] could and what we have to expect". Likewise, $BUSINESS_{BS}$ has enough confidence in HUB_A to not behave opportunistically and accepts the given rules:

> [HUB_A] could not afford any mistake, since the entire world is monitoring them. ($BUSINESS_{BS}$)

And $BANKING_{BS}$ moreover insinuated that he believes that HUB_C is trustworthy due to his integrity

> [HUB_C] not only speaks well about themselves but also acts accordingly. ($BANKING_{BS}$)

Thus, inter-organizational trust is a necessary pre-condition for the acceptance of giving the platform vendor the right to exert coercive and reward power.

Pattern 2: The strength of the negative relationship between the execution of coercive power and inter-organizational trust is moderated by the perceived legitimacy of power execution

Once a complementor has entered a platform ecosystem each platform vendor is in principle entitled to exert coercive power. Our cases indicate that the effect of the exertion of coercive power on inter-organizational trust may vary substantially. At INDIVIDUAL for instance, HUB_B exerted its coercive power by deciding to replace two software distributors that INDIVIDUAL had been collaborating with for many years. This solo-effort was considered to be illegitimate because given its many years of partnering with the two distributors INDIVIDUAL had expected to be at least slightly involved in that decision. According to $INDIVIDUAL_{BS}$ this negatively influenced inter-organizational trust:

> It certainly is problematic as we constantly built up a trustworthy relationship with those distributors. In such situations we definitely scrutinize HUB_B's measures. ($INDIVIDUAL_{BS}$)

In contrast, at AFFILIATE, HUB_D exerted coercive power by forcing AFFILIATE to pay a partner fee in each market it was partnering with HUB_D:

> Yet, we have to pay four times for the very same benefit. ($AFFILIATE_{BS}$)

But in contrast to the INDIVIDUAL case, trust was not damaged by the exertion of coercive power, since this was seen as legitimate:

> HUB_D is not capable to do it differently as it has not a bit of an overview. ($AFFILIATE_{BS}$)

Thus, while coercive power may have a negative effect on inter-organizational trust, this negative effect seems to exclusively realize if exertion of coercive power is perceived as illegitimate.

Therefore perceived illegitimacy seems to moderate the negative relationship between exertion of coercive power and inter-organizational trust.

Pattern 3: The acceptance of higher levels of coercive and reward power are necessary pre-conditions for the development of inter-personal trust

After a complementor has entered a partnership, it is confronted with the so called partner-levels, defined by all platform vendors across all analysed ecosystems. Similar to the entry barriers, these partner-levels guarantee each complementor certain rewards if the complementor is willing to comply with predefined entry requirements that are imposed upon each complementor. Moreover, each complementor has to comply with the contractually stipulated right of the platform vendor to punish the complementor, if the

complementor is non-compliant with the additional rules and additional entry requirements of the respective partner-level:

> Since several years, we are now, partner on the highest partner level. For this reason we have to comply with a certain demanded customer satisfaction, revenue, and, to the best of my knowledge, a certified product. ($BUSINESS_{BS}$)

> We are well aware to be somehow dependent upon HUB_B. As we try to get more appreciation of HUB_B we accept the demanded effort. ($INDIVIDUAL_{BS}$)

However, it is the acceptance of those additional coercions that lay the ground for the subsequent development of inter-personal trust. Because once a complementor has reached the highest partner-level, it usually gets assigned to an individual partner manager, acting as a personal and single point of contact – before that, inter-personal contacts are highly limited:

> The biggest change in our relationship with HUB_B occurred two years after the first participation in the ecosystem. At this time we decided to ascend the partner levels to become an attended partner. Not till this ascend, the direct interaction with individual boundary spanners was enabled. This definitely eased the communication with HUB_B. ($ENERGY_{BS}$)

As a consequence of the inter-personal interactions, the complementors reported that inter-personally trusted relationships evolved, i.e. trust "builds[t] up over time" ($LAYOUT_{BS}$) and increased "the more you know each other" ($INDIVIDUAL_{BS}$). For $COUNTER_{BS}$, this was well observable:

> Yet, we initially trusted HUB_D as an organization and their products since we did not know the employees back then. ($COUNTER_{BS}$)

But over the years, and after the raise of partner levels, the formation of inter-personal trust was enabled due to the allocated boundary spanners:

> We surely do trust the employees of HUB_D by today, since, in our eyes, it's them that represent the organization. ($COUNTER_{BS}$)

Interestingly, especially the geographic peculiarities of Switzerland, as a small country, together with the dense road and rail networks, seemed to have facilitated this emergence of inter-personally trusted relationships:

> This [attendance of complementors] is extremely country-specific. In Germany it was, for instance, largely based on telephone calls or emails, as the distances simply are too big. In Switzerland, however, personal on-site meetings are way easier to realize. ($HUB_{B\text{-}BS1}$)

And $HUB_{D\text{-}H}$ mentioned:

> Due to the small distances in Switzerland, we expect our partner managers to frequently visit their attended partners ($HUB_{D\text{-}H}$)

Taken together, the presented evidence suggests that the acceptance of higher levels of coercive and reward power are necessary pre-conditions for the development of inter-personal trust.

Pattern 4: Exercise of coercive power has no influence on inter-personal trust

Once a complementor has built up a trusted inter-personal relationship with a partner manager, the question arises how the exercise of direct power influences this inter-personal trust. For the case of coercive power, this relationship is surprisingly different from the relationship between coercive power and inter-organizational trust (cp. Pattern 2). While the exercise of coercive power is detrimental for inter-organizational trust, this was not the case for inter-personal trust. In fact, the exercise of coercive power seemed to have neither a positive nor a negative influence for inter-personal trust. $HUB_{A\text{-}BS2}$ mentioned for instance that whenever HUB_A imposed something upon LAYOUT, he does interpret such behavior as a sign of lack of inter-personal trustworthiness. The reason for this is that he is aware of his counterpart is acting as an agent of this platform vendor, i.e., he is not driven through his own motivation. In

the case of INDIVIDUAL, trust in HUB_B is only limited, while it remains high in its local employees, since they follow a slightly different, less aggressive strategy.

What is more: $AFFILIATE_{BS}$ does not even ascribe responsibility for exercising coercive power to the Swiss subsidiary of HUB_D because he believes that everything is solely governed by the international headquarters of HUB_D.

Hence, as partner managers are perceived to act as agents of a rather impersonal multi-national company, the inter-personal trust that a complementor places in the partner managers is not affected by coercive power.

Pattern 5: The direction of the relationship between the execution of reward power and inter-personal trust is moderated by the perceived legitimacy of the granted rewards

While coercive power as one type of direct power did not have any effect on inter-personal trust, the other type of direct power – i.e. reward power – did have an effect on inter-personal trust.

After some years of satisfactory collaboration at LAYOUT, HUB_A exercised its reward power by granting LAYOUT with the opportunity to present its company and its products to the European board of HUB_A. This heavily increased the companies' visibility inside the multi-national company HUB_A. As a consequence, LAYOUT was able to acquire new customers in Europe:

> [This] led to the acquisition of our biggest customer - based in the Netherlands. ($LAYOUT_{BS}$)

The exertion of reward power was therefore highly appreciated by $LAYOUT_{BS}$ and consequently promoted the development of trust in HUB_A's partner manager:

> I [$LAYOUT_{BS}$] believe that this enabled visibility heavily fostered our trust in $HUB_{A\text{-}BS2}$, our partner manager, as well as in the organization HUB_A.

However, the exercise of reward power does not necessarily have a positive effect on inter-personal trust. In fact, it might even have a negative effect if the reward that is granted to the complementor is not perceived as legitimate. This can be well illustrated with the case of BUSINESS. After several years of partnering with HUB_A, BUSINESS decided to develop a new software product that had to be tightly integrated with HUB_A's platform. Therefore, BUSINESS was heavily dependent on HUB_A's advice:

> At this time we were developing a new product for which we would have been heavily dependent on the support of the partner managers. ($BUSINESS_{BS}$)

As a consequence, HUB_A used its reward power by giving BUSINESS some information and support. Yet, the resulting effect on inter-personal trust was highly detrimental:

> As of today I would consider the cooperation as outstanding, despite my completely opposing feelings five years ago. ($BUSINESS_{BS}$)

Interestingly, the reason for this detrimental effect was, that reward granted by HUB_A was perceived to be not as expectable from such a platform vendor and therefore considered as illegitimate:

> The reactions were, however, only insufficient, unofficial, and unsealed data. ($BUSINESS_{BS}$)

In a similar vein, $AFFILIATE_{BS}$ was highly disappointed by the sales division of HUB_B that offered, in his eyes, inadequate marketing and sales support:

> You could imagine sales to be greengrocers whom have not a bit of an idea on how the vegetables actually grow or look like". ($AFFILIATE_{BS}$)

This incident ultimately led to enduring distrust between $AFFILIATE_{BS}$ and the respective sales clerks:

> I would consider this [marketing and sales support] as disastrous. (AFFILIATEBS)

Taken together, the presented evidence suggests that the effect of exercising reward for inter-personal trust can be either negative or positive – depending on whether the rewards granted are considered to be legitimate.

4.2 Indirect Power and Trust

While we have observed five different patterns of how different types of direct power interact with different types of trust, considerably fewer interactions were observed between indirect power and trust.

Pattern 6: Indirect power and inter-organizational trust are indirectly connected since they are derived from the same sources

Indirect power derives from expertise, legitimacy and the identification with the holder of power as a reference. Likewise, a trustor is more likely to develop trust if the trustee is perceived to possess distinct abilities, willing to not exploit opportunistic behavior (benevolence), and if it allows to develop a mutual identification. Thus, trust and indirect power seem to some extent be derived from similar, or even the very same sources. At COUNTER for instance, $COUNTER_{BS}$ expressed his willingness to follow HUB_D due its "strong brand". But at the same time he considered this power, based on reference, not as threat but as one aspect that positively influences his trust in the opposite organization.

Similarly at ENERGY, as a heavily dependent complementor, relying with every single product on the platform of HUB_B. $ENERGY_{BS}$ was, however, well aware of HUB_B's expert power since his company "heavily relies on major knowhow" about the platform. Yet, this expertise was not only a source of power; it also led $ENERGY_{BS}$ to develop confidence and trust towards HUB_B and its employees:

> What matters in the end, concerning trust, is relying on the provided knowhow. ($ENERGY_{BS}$)

Finally, at LAYOUT, $LAYOUT_{BS}$ was well aware of HUB_A's prominent role due to its extraordinary market share:

> HUB_A was, is, and will remain the most important provider of this platform type. ($LAYOUT_{BS}$)

Based on this perception he perceived the actions of HUB_A as legitimate even if they were at the expense of LAYOUT:

> For this reason we accept, for instance, to pay the partner fee, to obtain the required certifications, or even to conform to the demand of having a certain number of pleased customers. (LAYOUTBS)

Thus, at LAYOUT, the huge market share of the platform vendor, gave HUB_A's, to some extent detrimental, actions legitimacy, so that they were not perceived as non-benevolent.

Taken together, the presented evidence suggests that indirect power and inter-organizational trust are indirectly connected because they are derived from the same sources.

4.3 Summary of Findings

Our analysis revealed seven patterns of how different types of power interact with different types of trust. From a theoretical point of view positive relationships as they are expressed in pattern 1, pattern 3, pattern 5 (if perceived as legitimate), and pattern 6 can be seen as indicators for complementarity (Huber et al., 2011, Huber et al., 2013), while negative relationships as they are expressed in pattern 2 and pattern 5 (if perceived as illegitimate) can be seen as indicators for substitution (Huber et al., 2011). Besides a huge variety of interactions depending on the type of trust and power involved, those interactions also seem to systematically manifest at different points in time because the patterns themselves seem to be causally connected in such a way that one pattern may act as a necessary condition for another pattern to emerge (e.g. pattern 1 → pattern 2; pattern 2 → pattern 3 → pattern 4) as illustrated for each case in Table 4. Thus, power and trust may be both complements and substitutes depending on the point of time and the types that are involved in an interaction.

Case	Sequential order of patterns within each case[1]					
BUSINESS	Pattern 1[2]	Pattern 2	Pattern 3	Pattern 5	Pattern 4	
	Pattern 6					
LAYOUT	Pattern 1	Pattern 3	Pattern 4	Pattern 5		
	Pattern 6					
ENERGY	Pattern 1	Pattern 2	Pattern 3	Pattern 4		
	Pattern 6					
INDIVIDUAL	Pattern 1	Pattern 2	Pattern 3	Pattern 4		
	Pattern 6					
BANKING	Pattern 1	Pattern 2	Pattern 3	Pattern 5	Pattern 2	
	Pattern 6		Pattern 4			
COUNTER	Pattern 1	Pattern 2	Pattern 3	Pattern 2		
	Pattern 6					
AFFILIATE	Pattern 1	Pattern 2	Pattern 3	Pattern 2	Pattern 4	Pattern 5
	Pattern 6					

[1] Simplification of temporal sequence of pattern occurrence within each case, thus, patterns in the same column have not necessarily taken place in parallel. [2] If patterns in a case are vertically stacked then those patterns had temporal overlap.

Table 4: Sequential order of patterns

5 Discussion

This study was motivated by the goal to better understand coordination between huge multi-national platform vendors and small complementor companies. In doing so we investigated the interplay between two coordination mechanisms of paramount importance – trust and power. Our exploratory multiple-case study of seven partnerships between platform vendors and complementors revealed six different patterns of how trust and power interact. Given the absence of empirical studies on the interplay of trust and power, the discovery of those interaction patterns provides unique empirical insight and therefore has merit in its own right. However, those patterns also bear wider implications for the literature on platform ecosystems, the wider literature on trust and power, and managerial practice.

5.1 Contribution to Literature on Platform ecosystems

The findings of this study add to recent research on the emergence and the management of platform ecosystems (Ceccagnoli et al., 2012, Huang et al., 2013, Kude et al., 2012, Sztompka, 2000). In particular, previous literature studied the motivation of complementors to participate in platform ecosystems as well as the conditions under which these partnerships are successful by referring to the existence of higher-level societal institutions such as intellectual property rights that safeguard complementors against opportunistic behavior (Ceccagnoli et al., 2012, Huang et al., 2013). Our study, contributes to this stream of literature by focusing on two alternative coordination mechanisms that have not been studied before in this empirical context and that go beyond legal safeguards – trust and power. As shown by our findings, both trust and power are ubiquitous as means to coordinate partnerships in platform ecosystems. Since a huge variety of studies has already shown that trust is of major importance for any type of inter-organizational relationship, the omnipresence of trust does not come as a surprise in the context of platform ecosystems. However, we argued that due to the unique asymmetric dependency of this new type of inter-organizational collaboration, power may be a concept of paramount importance that has generally received hardly any attention but that is of paramount importance for understanding how partnerships in platform ecosystems are coordinated. The omnipresence of power in our study con-

firms this assumption. Thus, our findings suggest that platform ecosystems are a unique empirical context in which power may make all the difference and that is particularly suited to deepen our understanding of this fundamental principle of coordinating. Our study is a first step towards this direction.

5.2 Contribution to the wider literature on trust and power

In recent years a lively and controversial debate on the relationship of trust and power was raised in the field of general management and more sociologically oriented literature – with contradictory results (Alvarez et al., 2003, Bachmann, 2001, Hart and Saunders, 1997, Ireland and Webb, 2007, Jasperson et al., 2002, Lane and Bachmann, 1997, Molm, 1997). To clarify such debates it was recently proposed to adopt more fine-grained conceptualizations and to consider the role of time (Huber et al., 2011, Huber et al., 2013, Lewis, 2000). Inspired by these arguments we aimed to clarify the trust vs. power debate by adopting a more fine-grained conceptualization of both trust and power. In doing so we relied on the widely established distinction between inter-personal and inter-organizational trust, as well as on the conceptualization of French and Raven who distinguish five different types of power according to the source this power is derived from. In addition, we also considered the role of time by explicitly investigating the interplay of trust and power over the course of partnerships between complementors and platform vendors. Both strategies to clarify this debate proved successful because we were able to show that, first, different types of power and different types of trust interact differently with each other. Thus, contradictory results of prior research may be rooted in inconsistent conceptualizations. Second, our findings show that trust and power may be complements at one point in time but substitutes at a different point in time. Therefore, contradictory results of prior research may be the outcome of different times of measurement. Hence, our study provides and empirically substantiates two explanations for why the results of prior research may have been contradictory.

5.3 Contribution to managerial practice

This paper is based on the information of seven dyadic partnerships within four internationally leading EAS platform ecosystems. In doing so we principally highlighted the positions of platform vendors as holders of power together with its respective interplay with trust. As with this focus, the results of this study mainly represent a valuable source for platform vendors in understanding how the asymmetric dependence actually influences the interaction with the respective complementors. In doing so it moreover enables platform vendors an understanding on how to appropriately apply the provided power for effectively governing a respective platform ecosystem. Hence, our study provides practically applicable findings about the interaction of trust and power in different points in time that should facilitate the governance of platform ecosystems within the EAS industry.

5.4 Limitations and Future Research

As a concluding reflection, we point to the main limitations of this study. Our results point out that the patterns that occur at systematically different points in time. One possible reason for this occurrence are systematic temporal interdependencies amongst our patterns. However, this occurrence could also be triggered by external events. Future research should therefore further examine the reasons for this temporal interdependencies. A second limitation is presented by the fact, that all the investigated partnerships were located in Switzerland. Our results suggest that the distinct geographic conditions, with the short distances may have simplified the development of inter-personally trusted relationships. Thus, it would be favorable for future research to additionally investigate partnerships in larger countries to clarify the role of geographic proximity for the interplay of trust and power. Third, the results of our study are based on a limited number of cases, and moreover interviewee selection was based on snowball sampling where the platform boundary spanners were asked to select partner organizations. Hence, it might be that the selected case studies are not representative for the population of partnerships. Therefore, future research should not only try to study more cases but also make sure that the cases are representative for the population. Fourth, this study mostly relied on retrospective interviews. While this

reduced the risk of data overload, and while we took triangulation measures to ascertain the validity of our findings, respondents might still have had the opportunity to conceal valuable information. This might be particularly true for indirect power: While power-holders might disguise the exertion of power in general, the one who is subject to this power usually feels when direct power is exerted. Thus, triangulation works well for direct power. However, the influence of indirect power is more subtle such that the one who is subject to the exertion of indirect power might not even realize it. Hence, the limited number of interactions that involve indirect power might be a consequence of the data sources that we relied on. Thus, future studies should build on the results of our studies but rely on additional data sources such as observations to add further credence to the novel interaction patterns that we have unveiled through our empirical investigation.

Appendix

List of Case Specific Abbreviations

$COMPANY_{BS}$	Boundary spanner of COMPANY
$HUB_{X\text{-}BSY}$	Boundary spanner Y of HUB X
$HUB_{X\text{-}H}$	Head of Partner management at HUB X

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