Performance of B2B Platform Partnership Management

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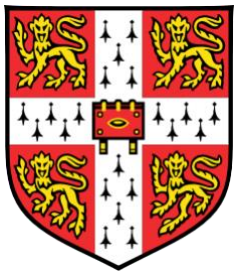

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Abstract

This short paper explores the foundations of B2B platform partnership management. After a theoretical derivation of the terminology, the performance measurement practices of a B2B platform owner offering the two platforms A and B to industrial customers are identified based on qualitative interviews with 21 employees. The research explores empirically whether and how platform partnership management performance is in reality measured, and what important success factors contribute to a functioning partnership management strategy.

Keywords: Business-to-Business • B2B • Platform • Ecosystem • Industrial Internet of Things (IIoT) • Segmentation • Verticalization • Vertical Information Systems

1 Introduction

Past research has examined complementor behaviour on video game platforms (Cennamo & Santalo, 2013), social media emergence (Li & Agarwal, 2017), business-to-consumer (B2C) retail platforms (Jiang, Jerath, & Srinivasan, 2011) or browser extensions as special form of platforms (Song, Xue, Rai, & Zhang, 2018). All the aforementioned platforms have the common characteristic that the consumer is most likely an individual who constitutes one platform side. More important application scenarios for platforms deployed in industry constitute business-to-business (B2B) platforms and their ecosystems.

In this short paper, a definition for platform partnership management and derived strategies in the context of B2B platforms is operationalized. This operationalization has been taken as an input for qualitative research to explore the practical mechanisms of platform partnership management performance.

The attractiveness of platforms is to a large extent dependent on their capability to serving market demand. In order to build up this demand, a platform needs to respond to the requirements of end-customers, who need to be convinced about an adoption of the system for their own operational requirements. A lively partner ecosystem helps the platform owner to providing better arguments for the valuation of a platform, as the end-customer is then more likely expected to finding a solution for a problematisation (cf. Jensen, 2002). The development of a platform thus requires balanced growth of all platform sides, a process that very much demands from partnership managers to attending to all relationships in the platform ecosystem simultaneously, which can best be described as a chicken-and-egg problem (cf. Roy-Charland, 2009).

As an example, when designing the platform, a company has realised three abstract architectural layers. The connectivity layer describes the part of the architecture that is responsible for capturing of data from connected assets for storage in data lakes. The connectivity is then very much subject to primary and secondary verticalization effects. Once data has been captured and transmitted to the storage via respective protocols, the information is kept and analysed in a generic platform layer, where barely any verticalization patterns are observable as data lake. Finally, the application layer can describe the part of the architecture that comprises applications and allows for a solution development, which is offered to the end-

customer. This layer is use-case oriented and could contain an app store, which is however not a requirement but also subject to verticalization. Either verticalization effects can be identified for this layer.

For the platform partnership management, it is important to understanding these effects for suitable partner types selection depending each platform layer. In the connectivity layer, these are mostly connectivity partners, implementors and consultancies, which often provide tailored support for specific industry requirements. The technology stack of the platform is formed with relatively generic components supplied by mostly non-specialised technology partners, and the cloud infrastructure for the data lake can be characterised by generic hyper scaling support. The partners on the application layer constitute “traditional” sides of a technology platform, with one side comprising developers and individual businesses. These co-create the platform ecosystem while interacting with the end-customers in a corporate context (cf. Tiwana and Bush, 2014).

This paper follows rigorous academic guidelines and quality controls, thus bridging a gap between theory and practice in the form of engaged scholarship (Van de Ven & Johnson, 2006).

2 Theoretical Background

Partnership management has its theoretical roots in the literature on inter-organizational relationships and strategic alliances. However, in many economic theories and fields partnerships play an important role, whether it is in supply chain management, organizational economics or competition theory. In a seminal paper by Mohr & Spekman (1994, p. 135), partnerships are defined as follows:

> "Partnerships are defined as purposive strategic relationships between independent firms who share compatible goals, strive for mutual benefit, and acknowledge a high level of mutual interdependence. They join efforts to achieve goals that each firm, acting alone, could not attain easily. The formation of these (…) partnerships is motivated primarily to gain competitive advantage in the marketplace."

The authors further highlight that partnerships have certain behavioural characteristics which are determinants for the partnership's success. As attributes of the partnership, commitment, coordination, and trust show strong positive indications for a successful partnership. Another important characteristic is the communication behaviour between partners, which is dependent on the communication quality, information sharing attitudes and a general participation in the partnership. Finally, conflict resolution techniques like joint problem solving and smoothing are found to be important elements in partnership management.

The definition emphasizes both the mutual interdependence between firms entering into a partnership and the strategic character such a partnership can have for the purpose of providing a competitive advantage for the partners. Mintzberg (1978, p. 935) defines the concept of strategy as a "pattern in a stream of decisions (…) strategies as intended, a priori guidelines as well as strategies as evolved, a posteriori consistencies in decisional behaviour. In other words, the strategy maker may formulate a strategy through a conscious process before he makes specific decisions, or a strategy may form gradually, perhaps unintentionally, as he makes his decisions one by one".

Platform partnerships depend on the organic growth of an ecosystem, but the patterns of partnership formation might be visible to the decision-makers and researchers only in the aftermath or during emergence – not necessarily as a planned action in advance. For example, a technological innovation might not have been feasible for a timespan to be included in the platform. Once a complementor offers it though based on newly developed interfaces, the

innovation suddenly is of interest for the platform owner and could be incorporated without prior intention to doing so. In fact, many platform partnerships might evolve without being strategically planned, but rather due to the convergence of mutual interest over time.

As Fuller, Jacobides and Reeves (2019, p. 2) stress, such "relationships combine aspects of competition and collaboration […] players co-evolve as they redefine their capabilities and relations over time". They further argue that on a strategic level, platform partnership management for the purpose of creating and maintaining an ecosystem requires a "shaping strategy, which refers to collaborating with others using indirect influence (including being influenced by others), being responsive to unpredictable changes, and evolving the ecosystem for mutual benefit" (p. 6). This is also necessary due to the different types of complementarities that form a "set of roles", as "some relationships between sets of actors will be unique, some supermodular, some generic, and others specific" (Jacobides, Cennamo and Gawer, 2018, p. 2265).

Taking the theoretical background of platform partnerships and strategy into account, Table 1 summarizes the most important definitions in the field of B2B platforms and their ecosystems as background for this paper.

Terminology	**Definition**	**Source**
Boundary Resources	"The software tools and regulations that serve as the interface for the arm's-length relationship between the platform owner and the application developer."	Ghazawneh and Henfridsson (2013, p. 174)
Digital Platform	"Technical artefacts where the platform is an extensible codebase, and the ecosystem comprises third-party modules complementing this codebase [with a] sociotechnical assemblage encompassing the technical elements (of software and hardware) and associated organisational processes and standards."	De Reuver et al. (2018, p. 126)
Ecosystem	"The ecosystem is defined by the alignment structure of the multilateral set of partners that need to interact in order for a focal value proposition to materialize."	Adner (2017, p. 42)
Partnerships	"Partnerships are defined as purposive strategic relationships between independent firms who share compatible goals, strive for mutual benefit, and acknowledge a high level of mutual interdependence. They join efforts to achieve goals that each firm, acting alone, could not attain easily. The formation of these […] partnerships is motivated primarily to gain competitive advantage in the marketplace."	Mohr and Spekman (1994, p. 135)
Platform Ecosystem	"Application of the product family logic of modularity, standards, and product differentiation to a product or service system broader than an internal or supply-chain-level product family."	Thomas et al. (2014, p. 205)
Strategy	"Pattern in a stream of decisions. […] strategies as intended, a priori guidelines as well as strategies as evolved, a posteriori consistencies in decisional behavior."	Mintzberg (1978, p. 935)

Technological Platform	"Technological platforms can be usefully seen as evolving organizations or meta-organizations that: (1) federate and coordinate constitutive agents who can innovate and compete; (2) create value by generating and harnessing economies of scope in supply or/and in demand; and (3) entail a technological architecture that is modular and composed of a core and a periphery."	Gawer (2014, p. 1245)

Table 1 Terminology and Definitions
(Source: Own Analysis)

These definitions build the foundation to operationalize and define B2B platform partnership management and derived strategies. For this paper, platform partnership management in a B2B context shall be defined as follows:

> Platform partnership management is defined as the establishment and cultivation of multilateral partnerships within an ecosystem orchestrated by the platform owner to realize a defined value proposition. It facilitates the development of a technological platform and a platform ecosystem that fulfils a service function formed around the technological platform. The technological platform incorporates elements of a digital platform and provides boundary resources as interfaces which in return enable the platform partnership management on a technical and socio-ecological level. Every partnership within the platform ecosystem adds value for the platform owner both by enabling the co-creation of economic value between ecosystem actors for mutual benefit and a subsequent value capture, as well as by increasing the perceived attractiveness and competitive position of its technological platform in the market. Undertaken in a B2B context, the partners of the managed platform ecosystem are solely business firm producers that combined use the technological platform as service venue for innovation.

This pursuit of platform partnership management can be purposeful when a dedicated planning of partnership building activities is performed. In such a case, a strategy can be developed based on a priori guidelines. However, this might not necessarily be required for the emergence of a partnership strategy when following the definition by Mintzberg (1978). For example, a pattern in the partnership management activities might only be visible after the ecosystem has grown to a certain size and maturity, when it becomes clear that e.g. a vertical industry especially profits from the platform usage. In a circular relationship between increased sales from the platform owner to an industry's actors and intensifying sales activities, the strategy to verticalize towards this industry could emerge posteriori. Therefore, platform partnership strategy can be operationalised based on the following definition:

> Platform partnership strategy describes an approach when the platform partnership management performed by the platform owner follows a pattern in a stream of decisions that is either previously planned or emergent over time. To create this pattern, the platform owner utilizes a set of partnership management

measures on a tactical level both in planning and execution stages. A successful platform partnership strategy aims to leverage a firm's resources for generating ecosystem growth, value co-creation and ultimately unlocking of a technological platform's competitive advantage.

A successful platform partnership management will in most cases require a strategy that enables the platform owner to maintain a productive interdependence with actors in its ecosystem.

3 Literature Review

The Industrial Internet of Things is a particularly suited example to study B2B platform ecosystems. Being an industry platform with a technological core, it fulfils the definition of an ecosystem-as-a-structure with digital elements and a managed business ecosystem surrounding it. Moreover, its value co-creation mechanism follows a service-dominant logic (Hein et al., 2019).

3.1 Elements of IIoT Platform Ecosystems

A problem in the existing literature is that platform ecosystem boundaries are rarely clearly defined (Autio & Thomas, 2014, p. 208), and occasionally transcend industry boundaries (Weber & Hine, 2015). The IIoT is such a case, as it can be potentially serving several industry verticals with one horizontal platform (see Section 1.2). Therefore, it is helpful to model the possible elements of an IIoT platform ecosystem, both the static actors that constitute potential partners for the platform owner and the dynamic relationships between actors. Indeed, a structured approach to analyse ecosystems has gained increasing popularity amongst scholars (cf. Basole, 2009; Jacobides et al., 2018; Urmetzer, Gill, & Reed, 2018). Riasanow et al. (2020) have made the effort to develop a generic IIoT ecosystem based on the e3 value methodology, as displayed in Figure 3. The actors and relationships comprised in this model entail the theoretical boundaries of this thesis. As has been established in the introduction, IIoT platforms are considered as representative examples of B2B platforms. Moreover, Riasanow et al. (2020) use the model as part of a cluster analysis, in which they show that many of its elements apply to platform ecosystems in several industries. The actors in the IIoT ecosystem are found to be as follows:

(1) IIoT Solution Provider: This actor is the platform owner of an IIoT platform ecosystem. He offers the complete solution to the actor "Manufacturer/OEM", by incentivizing the development and provision of complementary software and hardware on the platform. In some cases, this could also be his own products or applications. The IIoT solution provider typically provides a marketplace with proprietary or third-party applications of its complementary firms.

(2) **Manufacturer/OEM:** The manufacturer/OEM is the business end-user of the platform and one of the platform "sides". The name indicates an industrial end-user in a production environment but could be in fact any business that wants access to the software and hardware of an IIoT platform, for example in the smart home, asset management and energy industries.

(3) **Hardware/Software for the IIoT:** Comprising the actors "Sensor & Connectivity Provider", "Fog & Edge Computing Provider", as well as "Disruptive Hardware Provider", this represents the complementary "side" of the platform. These could be software developers, sensor component suppliers or specialized service providers.

(4) **Cloud Services:** The cloud services constitute an extensive backend of the IIoT solution. They involve the actors "Cloud Service Provider", "Cloud Platform Provider" and "Cloud Infrastructure Provider". The most prominent examples are Amazon Web Services, Microsoft Azure, Google Cloud and the Alibaba Cloud Platform. Also coined as "hyperscalers", Riasanow et al. (2020, p. 9) identify these actors as the "core of all digital platform ecosystems" that offer "industry-independent services".

(5) **Industrial IoT Consulting Services:** The implementation of IIoT solutions into existing processes is not trivial, which is why the manufacturer/OEM often requires support by specialised consulting services. These could be external firms or teams provided by the IIoT solution provider that implement the solution for the manufacturer/OEM.

(6) **Cyber Security Provider:** Since the IIoT solution requires the usage of company data that often contains sensitive information, cybersecurity is an important aspect for the manufacturer/OEM. Whether or not this is provided by a further actor in the system or directly by the IIoT solution provider, there will always be such an element required in the ecosystem.

(7) **Material, Equipment:** The actors "raw material supplier" and "factory equipment provider" are mainly relevant in industrial environments, when the IIoT solution is introduced in a factory. However, they represent any form of secondary actor or supplier that is relevant for the manufacturer/OEM as end-user for conducting his business.

(8) The customer: a downstream actor that is typically not directly linked to the IIoT solution provider in a B2B setting, as he often represents individuals using the products or services of the manufacturer/OEM.

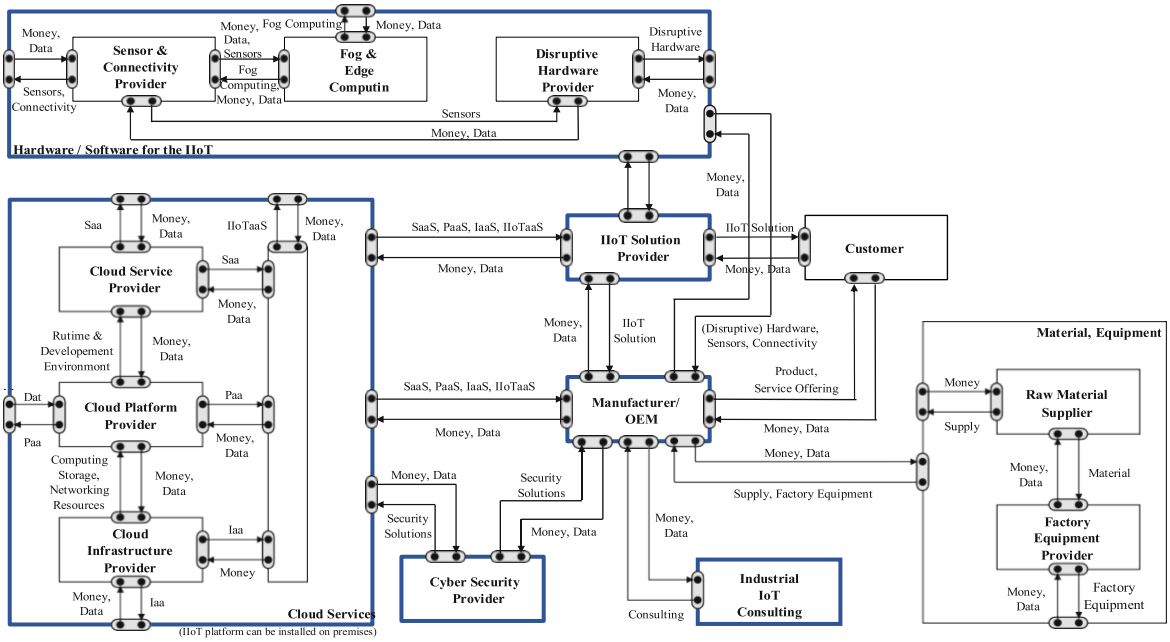

Figure 1 Elements of a Generic IIoT Platform Ecosystem
(Source: Based on Riasanow et al. (2020, p. 7))

In Figure 1, the exact relationships between the actors of the ecosystem are described, with the main drivers of the partner relations. For example, the IIoT solution provider offers the solution to the manufacturer/OEM, who in return provides the platform with his data and pays for the platform usage. For the purpose of this thesis, those entities are marked in blue colour that are considered as the main elements for the ecosystem and therefore subject to further analysis. The relationships to the customer actor and the material/equipment actors are left out in the remainder of the thesis due to their secondary nature from the perspective of the B2B platform owner.

An important element of any platform that has not been explicitly included in the model by Riasanow et al. (2020) is the theoretical concept of boundary resources. Since the platform owner aims to generate positive network externalities, he needs to encourage third-party developers to provide applications for his platform. This is only possible, however, if the platform owner provides the third-party developers with resources for the development. Ghazawneh and Henfridsson (2013, p. 174) defines those resources as "platform boundary resources, i.e. the software tools and regulations that serve as the interface for the arm's-length

relationship between the platform owner and the application developer". They are prerequisite for the provision of complementary assets and are therefore an important interface between the actors IIoT solution provider and Hardware/Software for the IIoT. Prominent technical examples for boundary resources (BR) are application programming interfaces (API) and software development kits (SDK). They can be classified as application boundary resources (ABR) that enable third-party interactions with the platform, respectively development boundary resources (DBR) that support the development of applications; additionally, a third layer of social boundary resources (SBR) helps to transfer knowledge from the platform owner to the developers, for example in the form of documentations (Dal Bianco et al., 2014, p. 15).

Petrik and Herzwurm (2019a, pp. 2-3) extend the BR model by including interfaces to other stakeholders into the consideration and therefore provide a framework that supplements the ecosystem perspective introduced earlier (Figure 2). They argue that there are BR that serve the end-user, as well, such as partnership programs, recommender systems and organising features. The inclusion of partnership programs and related social activities as SBR is an important concept against the background of this thesis and supports the idea that any partnership management must take both a technical and social layer into account.

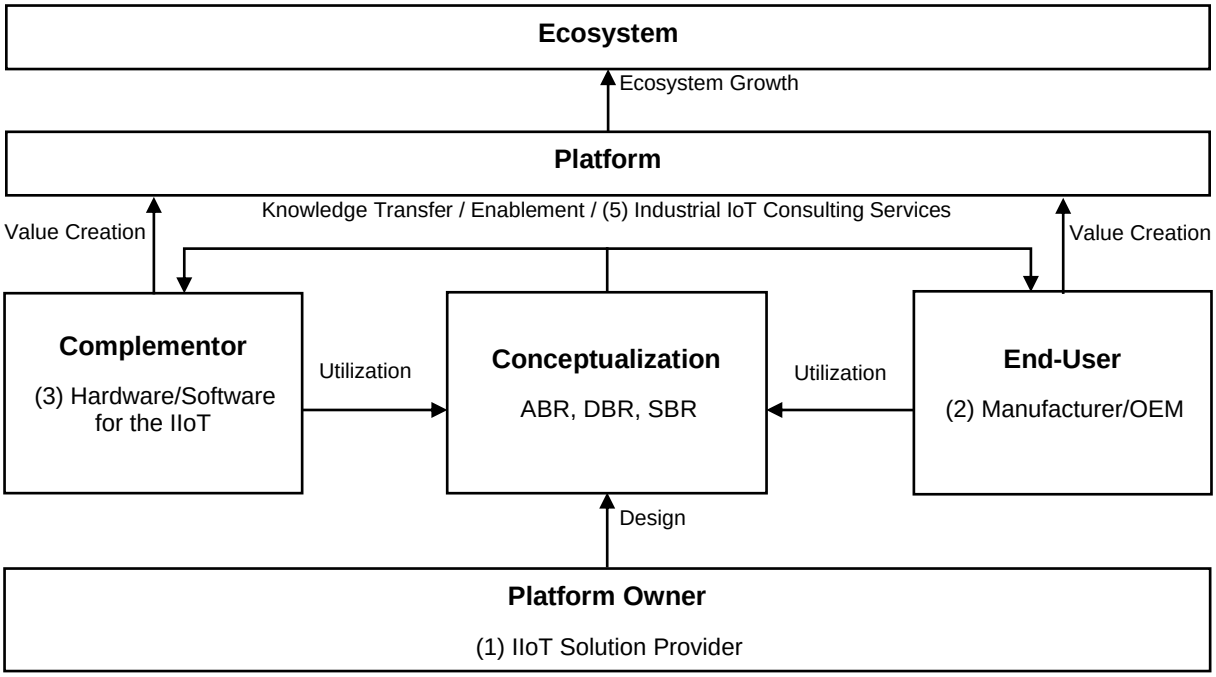

Figure 2 Boundary Resources in an IIoT Platform Ecosystem
(Source: Based on Petrik and Herzwurm (2019a, p. 3); Riasanow et al. (2020))

4 Research Design

The research results on platform partnership performance are the by-product of more extensive research on the theme of platform ecosystem verticalization in the context of market segmentation, which comprises an in-depth analysis of the platform ecosystems surrounding the two platforms A and B of a single IIoT platform vendor.

A less heterogenous group of ecosystem participants might be more easily manageable from a partnership perspective due to similar demands by the target group, both from a technological and social viewpoint. This addresses a central hypothesis that has been published prior to this research (Dietlmeier et al., 2023):

> **„It is proposed that the verticalization of B2B platforms should lead to a verticalization of the platform ecosystem and thereby changes the characteristics of platform partnership management" (p. 5).**

The idea of "verticalization" is applied as a theoretical lens for the empirical part of this paper. In line with Niederman and March (2019, p. 5), the theoretical lens describes a new way to examine the characteristics of ecosystem management strategies of the IIoT platform owner.

This concept contributes to theorizing and generalizing platform partnership management for B2B platforms, thus proposing the "verticalization" as a general context for the study (Niederman & March, 2019, p. 15). Indeed, the independent variable could even be characterised to alter the structure of an ecosystem and ultimately determine the dependent variable "platform partnership management" (cf. Adner 2017). This is in line with the "variance strategy" proposed in the field of information system research (cf. Sabherwal and Robey, 1995, pp. 304-305). Figure 3 depicts the research gap at the interface of management research and Information Systems (IS). A localisation of the present study could be derived at the interface of verticalization as market segmentation strategy, platform partnership management research, and ecosystem theory (cf. Kapoor, 2018).

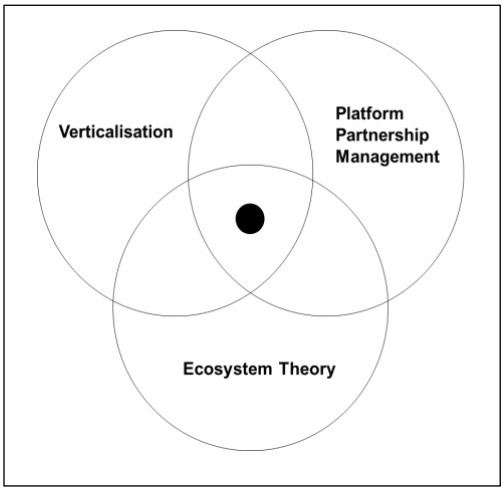

Figure 3 Research Gap of the Present Thesis (Source: Own Analysis)

4.1 Case Study Description

The literature review has displayed the need for platform owners to carefully plan and execute the ecosystem and partnership characteristics of their platform. In order to further examine the concept of platform verticalization, the case of two connected platforms offered by a platform owner was chosen to empirically demonstrate the characteristics of B2B platforms, their ecosystem and partnership management in a real-world example.

A single explanatory case study explores the theme of IIoT platform verticalization. The research philosophy assumes an interpretivist worldview (cf. Walsham, 1995). It entails a constructivist ontology due to an induced intersubjectivity in social interactions (Goldkuhl, 2012, p. 138): the underlying relationships studied by the researcher are constructed by personal interactions of ecosystem actors and ecosystem managers, even though they might rely to a certain degree on formalization and contracts, as the "organizational world is socially constructed" (Gioia, Corley & Hamilton, 2013, p. 17). The research approach is inductive, since digital platforms and their partnership management are relatively new phenomena and thus studied in an exploratory manner. Therefore, nascent prior theory is examined and the research follows an open-ended inquiry to develop a suggestive theory (Edmondson & McManus, 2007, p. 1160).

The platform owner is an internationally renowned technology firm offering industrial automation and digitization software and hardware, smart infrastructure solutions for buildings as well as mobility products and related intelligent software. These fields are covered in core businesses and supported by inhouse consulting.

Platform A was released with subsequent updates since 2016. Its main objective is the provision of a higher product and system availability for industrial customers when using the platform, allowing for a better efficiency and productivity. As an example of an IIoT platform, platform A enables customers to change their business models, for example towards a pay-per-use model for machinery, individualization and small batch sizes. The platform serves different industries with vertical-specific analytical apps when utilizing domain know-how, potentially allowing for the creation of a digital twin of the industrial devices. This is combined with software that allows to manage and collaborate on product data.

Platform B has been developed and operated by a subsidiary of the platform owner, serving as an application suite that is installed on top of Platform A as additional layer. Both platforms are thus interconnected by technological elements of the technology stack.

The platform A ecosystem is organized in three sides with two of them acting as complementors. A side of platform enablers is responsible for the technical operability which is ensured by both connectivity providers and system integrators, the latter is capable to deliver solutions along the entire value-chain. The "classical" software solution provider side comprises Technology Partners utilizing Big Data and AI; the Application Developers that develop and sell vertical apps, which could also be Independent Software Vendors; Hybrid Operational Technology Partners with expertise in automation and instrumentation; as well as the Consulting and Strategy services which could also develop apps but provide a whole spectrum of digital transformation services. Additionally, it involves the actors infrastructure (as an important platform element in the backend) and marketing (Aarikka-Stenroos & Ritala, 2017).

In the ecosystem model of platform A, the role of boundary resources such as the developer package and APIs play an important part. From a partnership management perspective, the partner program provides an important access point for partners who want to develop solutions for the platform, and a dedicated other program assembles the end-users. Data connection to physical assets is facilitated by dedicated connectors to be close to a plug & play solution based on industrial protocols and edge computing. Cyber and data security makes sure the platform provides secure data handling on multiple layers. This leads to a platform-as-a-service IIoT solution.

Platform B follows a similar architectural schematic compared to platform A, but provides less options for infrastructure providers and does not possess its own app store. Other than platform A, which serves multiple industry verticals, platform A offers solutions that are tailored to a single vertical only. This is also mirrored in the ecosystem, which consists of ecosystem actors that possess knowledge for this industry mainly. For either platforms, applications are developed both in a value co-creation process between the customers and complementors or the platform owner, as well as more generic solutions by the platform owner and complementors are offered.

Extending the work of Fink and Markovich (2008) on enterprise systems to digital platforms, the platform owner`s IIoT offering was found to display a primary and secondary verticalization effect based on a typology of the two different platforms. The “primary verticalization” effect describes a separation and interplay between the horizontal-adaptable Platform A and the vertical-specific Platform B. Platform B serves a niche market with a separated ecosystem due to industry-specific requirements and business models. The “secondary verticalization” effect describes efforts to differentiate Platform A to varied industry verticals.

The primary verticalization effect can describe the overarching relationship between Platform A and other market-specific platforms that the platform owner offers, one of which is Platform B (originally coined as „application suite“). The secondary verticalization effect can be found within platform A, where different platform and ecosystem elements are adapted to fit the implementation needs of a specific market. Therefore, it can be concluded that verticalization as a phenomenon can occur both platform-internally when managing a single platform and platform-externally when coordinating the interplay of platforms within a corporate conglomerate. It turned out to be difficult at times to really separate those two effects during the data collection and analysis process, but it was possible to identify four distinct dimensions along which patterns of verticalization are found to occur frequently. The verticalization effects follow patterns in the four dimensions “platform development”, “platform architecture”, “ecosystem orchestration” and “go-to-market strategy”.

The case implies that the advancement of IIoT can be accelerated by utilizing verticalization patterns. Therefore, the study provides a greater transparency of the complex IIoT and can serve present and future IIoT platform owners with valuable guidance for an advancement of the technology.

4.2 Research Approach

Interview candidates were chosen according to the principle of "purposive sampling" (Easterby-Smith, Thorpe, & Jackson, 2012, pp. 228-229). The selection was made through personal recommendations and a comprehensive LinkedIn-search. In the end, 21 interviews were conducted, with a duration between 23 min and 56 min, and an average duration of 37 min. 16 interviewees were direct employees of the firm deploying Platform A, who could focus their explanations on Platform A. 5 interviewees represented a subsidiary that is responsible for deploying Platform B. All respondents agreed to be recorded, answers were subsequently transcribed in full and anonymised. Table 2 displays the final distribution of study participants.

#	Nationality	Focus	Role	Platform	Length	Place
1	Germany	Internal	Platform Partnership Management	A	56 min	MS Teams
2	Germany	Complementors	Partner Program Management	A	23 min	MS Teams
3	Germany	Sales	Cloud Partnership Management	A	31 min	MS Teams
4	Germany	Strategy	Cloud Partnership Management	A	29 min	MS Teams
5	USA	Emerging Markets	Platform Product Management	A	44 min	MS Teams
6	Germany	Portfolio	Platform Trend Search	A	28 min	MS Teams
7	Germany	Internal	Platform Partnership Management	A	52 min	MS Teams
8	Germany	Business Unit	Cloud Partnership Management	A	27 min	MS Teams
9	Germany	Verticals	Ecosystem Management	A	26 min	MS Teams
10	Germany	End-Users	Partner Program Management	A	23 min	MS Teams
11	Germany	Portfolio	Platform Product Management	A	42 min	MS Teams
12	Germany	Global	Ecosystem Management	A	47 min	MS Teams
13	Germany	Corporate	Digitization Strategy	A	43 min	MS Teams
14	Germany	Industry	Sales	B	46 min	MS Teams
15	Germany	Industry	Analytics Network	B	37 min	MS Teams
16	Germany	Global	Platform Product Management	A	28 min	MS Teams
17	Germany	Industry	Management Consulting	B	39 min	MS Teams
18	UK	Industry	Digitization Strategy	B	28 min	MS Teams
19	Germany	Industry	Platform Partnership Management	B	54 min	MS Teams
20	Germany	Internal	Platform Partnership Management	A	25 min	MS Teams
21	India	Global	Platform Partnership Management	A	51 min	MS Teams

Table 2 Interview Partners for the Case Study Research
(Source: Own Analysis)

Interviews were semi-structured and followed a question catalogue that was developed in parallel to the literature review according to the principles of grounded theory (Strauss & Corbin, 1990, pp. 106-118). The questions dedicated to platform partnership management performance as displayed in the Appendix focused on key performance indicators. Interview best practice adheres to recognized standards (Brinkmann & Kvale, 2015).

The time-horizon of the research was cross-sectional and retrospective, as the short data collection period as part of a master's thesis did not allow for a longitudinal approach. A qualitative data analysis follows the best practice guidance outlined in Miles and Huberman (1994). Since the case study constitutes primarily a descriptive approach, the problem of inference must be addressed. This reasoning dilemma of qualitative research has been discussed extensively in the past; in the context of case study research, an approach of empirical contextualization has proven to be powerful to infer explanations based on empirical data (cf. Ketokivi & Mantere, 2010, p. 323).

The synthesis as part of the qualitative analysis is based on the pattern identification enabled by the qualitative research software NVIVO, a tool that has been frequently used for qualitative modelling before (cf. Yearworth, 2010). The coding approach follows the guidelines established by Gioia et al. (2013, pp. 20-22), and synthesizes the data in three orders by inductively coding into concepts, themes, and dimensions. Structuring of the data was supported by the semi-structured approach of the interviews. Table 3 provides some examples of the coding process used as basis of the synthesis approach.

Quote	Code	Concept (1st Order)	Theme (2nd Order)	Dimension (3rd Order)
"The decision to deliver any product is based on that balance of specialization versus generalization. That's a decision by the product owners and the different business units."	Balance of specialization versus generalization	Positioning in the market	Conceptual focus of the platform	Platform development
"Also (…), for example, they have an own platform for their things. And that can be very valid, because they have their own special security regulations or whatsoever, and they have different assets that they connect."	Special security regulations	Security standards	Verticalized connectivity layer	Platform architecture
"But I as a partner manager, I handle it in this way that every solution which is sold to one customer, then I have a chat with my counterpart on (…) sides and ask him ,OK, do you guys want also us promote your solution through our channel?'."	Offering central sales support	Organizational cross-business collaboration	Internal partnership management	Ecosystem orchestration
"So there is a partner organization and a marketing organization, and they have dedicated campaigns, industry-specific campaigns they call it. And within their campaigns, Platform A is also placed."	Industry-specific campaigns	End-customer engagement	Sales and marketing instruments	Go-to-market strategy

Table 3 Example of the Coding Process
(Source: Own Analysis; based on Gioia et al. (2013))

5 Results

Many firm-internal activities are audited and evaluated, and the platform owner usually has an interest in analysing the performance of its platform partnership management. This allows for an identification of strengths and weaknesses in the business processes, which allows the platform owner to derive the partnership management strategies. The performance measurement thereby works bidirectional. As process, this not only describes the performance of an individual partner when contributing to the success of the platform ecosystem as an external performance measurement. But it also refers to the partnering activities that are initiated by the platform owner.

The empirical findings provide insights into the procedural approach that the platform owner follows to evaluate the performance of platform partners and the partner relations. Moreover, performance criteria that are applied by the platform owner point towards a generalizable target system for the platform partnership management of IIoT platforms. Any evaluation system of the platform partnership management also requires specific organizational characteristics for the procedures, as well as a comprehensive review process for the partnership performance. Finally, not only formalized performance criteria to evaluate platform partners and partner relations play a role in the orchestration of the ecosystem, but also informal criteria that reflect the inter-personal and comparably subjective character of platform partnership management.

5.1 Performance Evaluation Procedure

When evaluating the performance of platform partner relations and the underlying management processes, the platform owner takes organizational characteristics of the relationships and the structure of the ecosystem into account. The interviews also highlight that a well-prepared partner review process, which is used in the in the platform ecosystems of platforms A and B as prerequisite for a successful method to evaluate the partnership performance.

5.1.1 Organizational Characteristics

The partner managers in the ecosystem of platform A have a dedicated set of targets to fulfil, which differs to that of enterprise software products that are also managed by the same organizational unit. Nevertheless, the reporting about the partnership progress and the fulfilment of the targets reaches the same line manager, which shows that the platform is mainly

considered a software product and does not require a highly specialized skill set to run the platform partnerships. Instead, the management is approached similarly to other forms of partnerships in the software development domain.

> "[Enterprise Software System C] has a lot of products, for lifecycle management and application. They have lot of software products, and they have different managers, but not so many. [Platform A] was exclusive, but [Enterprise Software System C] has a different organizational ecosystem. But both were reporting finally to the same person, though they were two different parallel sub-business units. I would very closely work with the [Enterprise Software System C] alliance manager […] But he follows a different set of targets. I follow a different set of targets." (B.21)

The more standardized the partner management is structured, the clearer are the requirements for the platform partners, which is categorized in the tier system of the partner program for Platform A. There, the platform owner has distinct expectations for the performance of an individual partner based on previously defined boundary performance values that differentiate the individual partner in its status, prestige and contribution ability within the ecosystem. Whilst app developers are present in all three tiers of the partner program, the hurdle to become a platinum partner is high.

> "Platinum would be large organizations in terms of what is their revenue, what is their net worth, what is their sales turnover. Such that they have the capacity to invest and they have a larger network. They are globally placed. They have a great market reputation. They have a great clientele. […] Platinum partners have more to do with the net worth of the organization, what kind of balance sheet they have, what kind of resources they have, how globally well-placed they are. And apart from that, what commitment they give to Company Y – to the top management of Company Y." (B.21)

The partnership management approach of Platform B is by far less standardized than Platform A, which is also reflected in the performance measurement system that is more agile than in the Platform A ecosystem and does not involve a categorizing tier system.

> "Not so evolved as Platform A; of course we have a partner lifecycle and processes, and we have KPIs. As we have always tended to grow our ecosystem very sustainable in a rather slow way, we have a tailored approach for partners. We do not have a one size fits all approach for partners." (B.19)

For this, the partner ecosystem is simply too small for a standardized KPI system to become necessary.

> "We don't need that much of regulation and standardization as for such a big platform as Platform A. So we do have this two-hands full of partners, and I think for them we have a really close and agile relationship, not so standardized as in a big ecosystem." (B.17)

Moreover, a business unit like the subsidiary owner of Platform B has a high degree of autonomy in its target setting and the freedom to design their platform ecosystem independently from Platform A. This is also then reflected in independent performance evaluation methods of their ecosystem partners. Nevertheless, for any partner in either ecosystems, the KPIs are defined in the partner agreement.

5.1.2 Review Process

Common to both platform ecosystems is the approach to review the performance of the platform partners in regular intervals. This review needs to be agreed upon by both parties, and is signed as a commitment in the form of a signed business planning.

> "We are measuring that based on some business planning, so each of the partners is having a strong and reliable and agreed and signed business planning, consisting of a couple of slides." (B.4)

Due to a difficulty of undertaking ongoing measurements, it is a period review rather than a continuous review.

> "It's hard to do it continuously, but there needs to be some agreed periodic review. And certainly, it should occur no less frequently than yearly." (B.5)

In Platform A, the present method of reviewing performance of a partnership on a senior level is in the form of a quarterly business review, with a yearly review currently being developed. In Platform B, the review is conducted on a yearly basis already. In these reviews, for instance if the partner is developing applications for Platform A, the progress of the partners' success with regard to app development and usage is evaluated and monitored.

> "It was done on a quarterly basis, really checking for progress, for example when it came to promises how many apps shall be released or it came to how many instances were really operated off the applications. So how many customers purchased it and actively used it." (B.8)

Whilst this type of partner performance and evaluation review is mainly conducted by top-level executives, a level below, on the operational level, there are more frequent reviews taking place.

> "Me and my boss, sitting out in US, who is the Senior VP or the president rather, we would do it almost on a monthly basis. Rather weekly we have in terms of revenues, where we are going through the pipeline and the revenues." (B.21)

In addition to that, a contract is reviewed every 12 months of the partnership, to evaluate the performance of the partner and the top management commitment of this partner, which could decide about the status in the tier system and then lead to an adjustment in the partner's categorization. This system of reviews, building upon the target system, can then shed light on the challenges of the partner and the partnership. Should the partnership performance not suffice in the eye of the platform owner, then it is in the responsibility of the individual partner manager to take action. If the reason for this underperformance is not attributable to the behaviour of a partner, but rather caused by an underperformance of a whole market or industry, this most likely leads to a common re-strategizing with the partner rather than a unilateral response by the platform owner.

> "If there is an industry stagnation or for that matter, then maybe we can think how to rephrase or how to re-strategize, both together – partner and Company Y. But that could not be a reason to evaluate a partner." (B.21)

However, if there is a lack of commitment by the partner, which very rarely occurs, then it is in the responsibility of the partner manager to examine the reason for this and to potentially resolve the situation. Such an intervention could then happen in two steps. At first, an emergency meeting with the partner would be called.

> "There's an SOS meeting called, if it is not on track, how do we get it back on track. This is very, very religiously done." (B.21)

In a second step, the partner manager works with the partner to resolve the problem and to develop a common business plan, which should bring the partner engagement back on track.

> "If there is the partner who is not doing anything at all, or maybe you don't have much more contacts, then the question is 'OK, what do we do with the partner, how do you see his role'. And of course, then

> you get in contact, in touch with the partner and say 'OK, what are you planning to do?' and make a common business plan." (B.7)

Besides the KPIs that the partners are evaluated upon, it is also in the interest of the platform owner to collect feedback on its platform as part of the platform partnership management. This takes for instance part in a partner program (platform side?), which is the previously described end-customer community for the advancement of the IIoT. Indeed, it is almost as if the evaluation processed is reversed, as in this partner program, it is the end-customer partner side that evaluates the functionality of Platform A and allows the platform owner to act upon their recommendations.

> "Questions or critical questions which are coming up, this is perfectly fine. And this is the voice of the community and the customers." (B.7)

This implies that some form of reciprocal performance measurements is important for the platform ecosystem and any feedback and expectations should be transmitted actively in both directions: communicated from the platform owner to the ecosystem partner, as well as the other way around. All in all, it can be summarized that any platform partnership strategies require the development for both an organizational system of partnership managers that can create and monitor the performance of their partners, as well as the need to create a review process to then evaluate the performance of partnerships in regular intervals.

5.2 Performance Criteria

The performance of partnerships can be measured by both quantitative and qualitative key performance indicators. Whilst the former are more formalized in nature, any qualitative measurement can be described as soft criteria, that rely to some degree on rather subjective evaluations by the partnership managers. In Platform A and B ecosystems, there are several key performance indicators that were identified during the interviews for this thesis, which are presented below.

5.2.1 Formalized Criteria

It depends on the underlying business model of the platform, the scope of the platform and its approach of external partnership management, which was described in detail in the previous chapter, whether there are rigid pre-selection performance requirements in place, before a

partner can join the ecosystem. In the beginning, this hurdle could be very small, which can be witnessed in the development of Platform A.

> "If you are interested to become a partner, you can become a partner. The clear goal was as fast as possible as many partners as possible on board, which resided after two or three years that the market or research companies said Platform A has the biggest partner ecosystem in the world for this IoT approach. […] But to be quite honest, everybody who said I want to become a partner, I said 'yes, you're welcome'." (XY)

Once the platform ecosystem is more mature, the evaluation of a pre-selection performance gains more weight. This is a logical approach, given that the success of the platform highly depends on a lively partner ecosystem.

> "Typically, all of this unfolds as a function of the maturity of the platform. At the beginning, you just want to get partners." (B.5)

In the case of Platform A, pre-selection performance had a far higher importance than in the Platform B case from the beginning. This might be necessary due to the smaller ecosystem and niche market that the platform addresses, and a partnership would usually evolve around a pilot project.

> "We usually start the partnership with concrete requirements from existing or upcoming customers, and we also build the partnership around pilot projects. And only when we have a pilot project, then we go ahead and build the partnership, and then scale and grow the partnership." (B.19)

When the platform ecosystem is mature enough for a more thorough evaluation of the partners' contributions to the platform, the individual type of the platform partner forms the basis for the criteria with which the partner and the success of the partnership would be evaluated.

> "For example, in the technology space, you would look for technicalities. So is he actually capable of delivering certain connectivity elements, code, whatever? For services, you would look for is he actually capable of delivering in terms of the people that he has, and the skills of the people? For ISV, you would look for competencies in terms of coding and also industry knowledge, vertical knowledge, and for a solution partner who is delivering along the value chain, you would look for everything." (B.3)

There is a distinct difference between assessing the performance of partners that provide content for the platform, like applications and solutions, and partners that are needed to build,

maintain and advance the technology stack of the platform itself. The former partners are primarily responsible for broadening the platform scope in terms of the use cases that are offered on top of the IIoT platform. Therefore, any partnership that is supposed to lead to an increase in the application offering will ultimately be measured by the revenue that the partner can create with its application offering.

> "On the 'what' side, from the KPI perspective, you're partnering with other entities in order to primarily broaden the scope of what it is that you're able to do. So the revenue associated with what a partner is doing, what is its additive benefit for the ecosystem, is always going to be a key measurement." (B.5)

The output of the development partners in terms of applications that were built and sold over a certain period, so the generated direct or indirect revenue on the platform, is the most relevant quantifiable target. Platform B uses comparable KPIs, such as the generated sales by of a partner application, without the standardised tier system as Platform A has though. However, this target setting and performance measurement is difficult in the beginning, as much of the revenue might be generated only after a scaling phase.

> "Because the real revenue happens when solutions are scaled-up. Actually, it's not so easy or it's not so fast, that end-customers, especially big end-customers, scale these things up. They try it out and they do it for one factory and so on. And it also takes a bit more time than anticipated. So it's not so easy." (B.11)

This could be accompanied by tracking Platform A licenses that are marketed to the partners' customers. From the revenue of the partner and the applications that he develops, there can be other measurements derived that inform the platform owner about the ecosystem health. These could be, for instance, the number of additional customers that a partner brings to the platform, which thereby increases the growth rate of the participants in the ecosystem. Especially for solution partners, their individual salesforce of at least 200-250 people is a core criterion, since they are supposed to deliver a multiplier effect by selling the platform themselves to their customers.

For partners that contribute to the platform layer, there should be both strict quantitative and qualitative key performance metrics in place, which measure for instance the service level availability – especially when the partner is an infrastructure provider. But also the performance of the compute infrastructure and the security mechanisms that safeguard the cloud integration

need to be measured by the platform owner. In the best case, the performance requirements for these individual KPIs are contractually regulated.

> "At the 'how' level, there are very extensive set of KPIs that you need to create and contract with your partners. Because if it's not contracted with these partners, it is meaningless. So when you go off to buy technology, you'd better very well understand that technology and the KPIs associated with that technology that make it worth buying, because if you're not guaranteed delivery of those KPIs of that technology, you have no idea what you're buying and you're not guaranteed what it is that you're buying." (B.5)

A further important and quantifiable criterion for the evaluation of a partner's behaviour is the firm's participation in training programs provided by the platform owner, which is especially for larger partners an important task. They are required to have a certain number of their employees trained in the functionalities of Platform A, which are then certified by the platform owner for their knowledge and expertise and can serve as trainers themselves.

> "We have people based across the globe, like solution architects, to verify whether they are trained or not. Then we went to the extent of certifying them, as well. So how well they have done, what is the number of trainers they have? How much are they consuming these services?" (B.21)

The performance of the other platform side, the end-customers, is also monitored and directly related to the growth of the platform. The most important KPI for them is the number of connected asset by the respective end-customer, as a higher number of assets is potentially correlated with a growing ecosystem and can unlock future revenue.

> "And then another thing is just ecosystem growth, so number of connected devices is super important and number of users in the platform, because that's the foundation for future revenue." (B.11)

The partner managers have for the partnership performance evaluations some discretionary levers. For instance, strategically important partners could miss the performance targets of the partner program, but still be placed in a higher category as the quantifiable results would indicate.

> "The program is standardized. In principle standardized, so you have rules for being gold, silver, platinum partner, but as always there are exceptions, right? Sometimes the partner is very strategic, then you might put him to silver, even if he has not committed the revenue that's necessary for being a silver partner." (B.11)

The most important and strictly scrutinized expectation towards a partner is compliance with rules and regulations, which has been imposed by the platform owner on all its partners. This cannot be compromised and would lead to a termination of the contract.

> "Compliance is non-compromising. In terms of compliance, it's very strict. If we find noncompliance, then it's a warning and then the contract ends. But it didn't happen in my opinion, it never happened. But a lot of mails have been exchanged. And it falls in place." (B.21)

With large partners, which already have a good reputation themselves, this is barely a problem.

5.2.2 Soft Criteria

Besides these quantifiable performance measures, there are a number of other criteria that can be informative of the success of platform partnerships. Though the different partnership types could be measured with quantifiable, but differentiated criteria, this has not yet been formalized by the Platform B partnership team. Instead, there are rough differentiation indicators which the partnership managers should keep in mind when assessing partnerships.

> "A solution partner you would measure on the value that he brings in terms of projects. An ISV partner you would measure on the logos that he brings and the vertical knowledge that he has, meaning references, a service partner you would measure on delivery and the technology partner you would measure on consistency with regards to his code or his technical abilities." (B.3)

Many of those indicators, such as value of knowledge, delivery effectiveness or consistency, can be evaluated rather qualitatively based on the individual experience of the partnership manager and his knowledge about a certain industry. Also, prior projects together with the platform owner might provide the partnership manager with a feeling about the strengths and weaknesses of a partner.

Another key parameter that partnership managers need to consider is the overall ecosystem diversity, which directly contributes to the health of the ecosystem. Therefore, the platform ecosystem should entail different types of partners.

> "It's a diversity of partners or alliances. Meaning you need to find, first of all, reliable and sustainable kind of partnerships from both ways. Always, it's a give and take. It's not like we wanted to sell something to partners or other way around." (B.4)

This ecosystem diversity and also the ecosystem growth could vary depending on the internal expectations that the top management has for the performance of partnerships, which can either facilitate or dampen the speed to develop new partnerships. Although there are formalized criteria which show the financial success of a partner in the ecosystem, this does not necessarily provide the full picture. Whether a partner is fully enabled to contribute his very best in the ecosystem might also depend on his capability to bring an application to his own customers, the success rate of which lies outside the sphere of influence and transparency for the partnership manager.

> "One thing is, which we talked about, to have a good and viable and proactive partner ecosystem. And with that I mean not just having logos on a page, but really partners that are enabled, and partners that by themselves utilize this technology and bring it to the customers, to their own customers." (B.13)

Moreover, as has been indicated many times before, the ecosystem size plays a decisive role about the degree of standardization of the performance measures, which is considerably lower in a small platform ecosystem like Platform B has.

> "We do have these two-hands full of partners, and I think for them we have a really close and agile relationship, not so standardized as in a big ecosystem." (B.17)

Nevertheless, there are also key performance indicators measuring the success of partnerships in the Platform B ecosystem, which are much more individualized to the specific partner as compared to the tier level system of Platform A.

> "We don't have standardized KPIs, so we are looking from partner to partner. We have defined partner by partner certain success criteria, meaning that we consider this partnership as a success and also the partner. By now we have around 15, 16 partners and more in the pipeline, but still a kind of smaller size. So there is really the focus on individual collaboration with the partners and no formal KPI set in measuring all at the same KPI." (B.15)

Other soft factors considered in the Platform B ecosystem, which is certainly also viable for Platform A are the general partner behaviour and engagement.

> "Do they bring opportunities to our attention? How do they actively engage, or do we have to bring them to the customer? Do they have dedicated resources?" (B.19)

Overall, the Platform B partner management relies, like also Platform A on both formalized and soft criteria to measure the partner performance.

> "And while we concentrate, of course, on hard KPI, we also include soft KPIs, like the name and the position of the partner that we need in our ecosystem." (B.19)

Therefore, summarizing for the partnership management of IIoT platforms for a platform owner, described has been a set of KPIs that should provide a portrayal of the external partner in as many different facets as possible and identify the value that this partner has provided to the ecosystem. For the internal partnerships between the business units, there has not yet been a cross-functional KPI target system for further development of Platform A or B reported, although applications have been developed. The individual business units thus have their own targets for the development of digital solutions. Rather, the internal partnership manager steer the activities in the form of common business plans, once they find suitable projects for further collaborations.

6 Discussion

The purpose of this paper was the identification of platform partnership performance management As a specific manifestation of B2B platforms, the study focuses on platform solutions that enable the Industrial Internet of Things (IIoT). A comprehensive case study of a leading IIoT platform owner with its IIoT Platform A and a subsidiary's Platform B has thus been conducted (cf. Riasanow, 2020). Utilising a grounded theory approach, 21 semi-structured interviews were held with employees of the platform owner and its subsidiary to identify verticalization patterns.

The development of a platform has been proven to be a demanding task for the platform owner, as the IIoT is not yet a mature technology and the digital transformation of potential customers plays a crucial role in the ability to capitalise on the technology's value proposition (cf. Petrik and Herzwurm, 2019a). Two predominant questions have emerged within the formation process: how to best conceptualise the focus of the platform and what measures are necessary to respond optimally to market demand. These two questions inform the interplay between the primary and secondary verticalization effect, when it is of high strategic interest to serve the need of a market as efficiently as possible, for gaining a higher market share (cf. Jacobides and Reeves, 2019). Indeed, both Platform A and B have their own characteristics that try to achieving this market fit and were found to be continuously adapted over time. This indicates the need to comprehend a platform development process as a co-evolutionary undertaking with regular reviews about the uptake in the market (cf. Dal Bianco et al., 2014). However, any platform can only be successful if its initial conceptual focus is delivered in line with the firm's capabilities and the market's expectation.

The platform ecosystems surrounding both platforms are complex, but display these complexities in different ways. Whilst Platform A is serving multiple verticals and therefore needs partners and end-customers from many different industries to joining its platform ecosystem, Platform B focuses very much on partners and end-customers from the rail industry. For Platform A, it is therefore important to not only consider the external partnership management as an important element of ecosystem orchestration, but also a system of internal partnership managers that maintain relations with the business units in their attempt to utilise the industry-specific capabilities of these business units (cf. Ghazawneh and Henfriedsson, 2013). This application of federated capabilities is a clear indication for the secondary

verticalization effect. However, external partnership management for either Platforms A and B is clearly separated with individual partner programs and processes, therefore showing primary verticalization, as well.

7 Limitations

Though the paper was written with the firm intent to apply a rigorous academic approach, there are certain aspects that might invite criticism by other scholars. Some of these aspects will be presented and discussed in this chapter, in an attempt to not only point out these shortcomings as implications for future research, but also to justify and vindicate them. The Qualitative Legitimation Model developed by Onwuegbuzie and Leech (2007, p. 234) was taken into consideration when avoiding threats to internal and external credibility of the research.

The literature review was conducted based on the initial quality criterion of journal quality, when the original database search was performed; this limited results to only journals included in the Basket of 8 and the Financial Times 50 selection. However, as the backward and forward search indicated, much of the relevant literature was found in journals with a B2B focus and other conferences, perhaps due to the recent interest spike in the topic given the advancement of IIoT systems. Therefore, future research is well-advised to extend the search parameters by a more careful initial selection of journals. Moreover, the limitation to academic journals disregards the fact that grey literature, in particular government, consultancy, and academy reports, might provide an insightful alternative source of knowledge, given that platform ecosystems and partnership management is less a theoretical but rather a practice-oriented research topic. The further process of literature selection could have been prone to some researcher bias. Even though a scoring system should provide best-possible transparency about inclusion- and exclusion decisions, a validation by a second researcher would have been useful but was not feasible due to time and resource constraints. This has been mitigated, however, in conversation with Senior Innovation and Leadership Representatives of the platform owner.

When evaluating the quality of empirical studies, there are several (although methodologically controversial) approaches to transfer quality criteria originating from quantitative research to qualitative research. For example, Lincoln and Guba (1986) argue in favour of the criteria “trustworthiness” and “authenticity”. Below, the popular criteria of objectivity, reliability and validity are discussed in the context of the present study (cf. Kirk & Miller, 1986):

- **Objectivity.** The author’s history as a former employee of the platform owner must be mentioned. Whilst a familiarity with the company certainly was an advantage for conducting the case study, this also bears the risk of a reduced objectivity and

increased researcher bias. Moreover, applying an approach of snowball-sampling could have introduced some reactivity to the respondent' behaviour. To counterbalance this risk, a high stability in the measuring instrument based on the semi-structured question catalogue was aimed for.

- **Reliability.** Much of the data quality in the empirical part of the thesis is dependent on a purposive recruitment of interview candidates. In the recruitment process, 63 employees of the platform owner in total were asked to participate in the study, of which 21 agreed. Given that only 3 interviewees were female and only 3 interviewees had nationalities other than German, the demographics of the data could be skewed, which however was outside the sphere of influence of the researcher. Overall, the participation ratio is 33%, which is relatively low. This might be due to the outside view taken on the organisation, with limited internal support. The overall reliability of the study could be thus somewhat limited, as the organization of Platform A relies on a high headcount and the selection of different interviewees might introduce new or different viewpoints. However, it is still an acceptable overall number.

- **Validity.** The content validity of the concept "verticalization", especially before the study was conducted, was rather speculative in nature. Mentioned in the paper authored by Schermuly et al. (2019), it was at first merely identified as a vague phenomenon without clear conceptualization. Even though an earlier research conducted by Fink and Markovich (2008) points in a similar direction in the context of enterprise system markets, the definition was fuzzy with regard to the degree of productization required to support the concept. In the course of this study, an effort was made to sharpen the boundaries, and thus to increase the content and construct validity. It is also unclear whether a causality exists that verticalization alters directly the ecosystem and platform partnership management. It seems likely that this represents a correlation relationship though, where the effects emerge simultaneously.

- **Transpositioning-Capability.** A major problem of any case analysis with N=1 is a lack of generalizability. As Leonard-Barton (1990, p. 250) points out, "multiple cases augment external validity and help guard against observer biases". A single case study method to explore the concept of "platform partnership performance" could indeed misrepresent the importance of this phenomenon for the IIoT market, therefore risking

an exaggeration of its applicability in some verticals. However, as it was pointed out in the methodological section of this thesis, the case study was selected as a deviant case and as such not aiming for the target of representativeness, but for exploration and explanation of the phenomenon. The findings could be representative for cases of other diversified industrial corporations that have developed IIoT solutions. Confirmatory case studies of the identified "verticalization" effects could then increase the reliability of the findings transpositioned between different industry verticals and their use case scenarios.

8 Conclusion

An important element of the ecosystem has been identified as the end-customers, which are included in the ecosystem orchestration efforts by industry-specific value co-creation projects with business units. This happens frequently both for Platform A and B verticals industry-specific, either showing verticalization effects. Finally, the governance modelling, which is supposed to steering the activities on the platform, is driven out of internal and external considerations. Whilst the internal considerations aim to treating industry verticals predominantly homogeneously, the external factors lead to necessary adaptations and verticalization effects.

The results have potentially a real-world impact, as they could serve as a best-practice guide for platform partnership management, specifically for Industrial Internet of Things (IIoT) platforms. Their importance for the digitisation of industry is increasing and can be seen as a cornerstone to realising the fourth industrial revolution.

It would be interesting to compare the case study with a longitudinal study in a case where IIoT platforms have just begun to be developed. This would allow to capture the decision-making rationales behind the early conceptualisation of platform partnership management, and would therefore clarify the relationship between the variables. An increase in both internal and construct validity could then be achieved longitudinally (Leonard-Barton, 1990, p. 253).

Finally, it would have been useful to include a review step in the stage-gate data collection process, during which the stakeholders of Platform B, both complementors and end-users, could have been interviewed. Their views would have been valuable and might have corroborated the theory due to their experiences with a vertical platform solution. This would have been also helpful, given that although Platform B is categorised as a platform, it is more often regarded as an “application suite” that does rely only partially on typical platform and network effects.

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Appendix

Semi-Structured Question Guideline
Key Performance Indicators for Platform Partnership Management

- Are defined targets/metrics used to evaluate the performance of [platform] partnership management?
- Is the performance measurement industry-dependent?
- How are partners categorized, do they have different requirements for expertise and performance? Is there a difference between types of partners, for example sales and implementation partners as well as development partners?
- With what characteristics would you describe a successful IIoT platform? Does the company have dedicated performance criteria?
- What role does platform partnership management play in supporting these characteristics?

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