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## Digital Platforms for Inter-firm Collaborations – Identifying current Challenges

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Marc Brechtel\*

University of Potsdam, Rudolf-Breitscheid-Str. 185-189, 14482  
Potsdam, Germany.  
E-mail: marc.brechtel@uni-potsdam.de

Stephan Altmann

University of Applied Sciences Mannheim, Paul-Wittsack-Str. 10,  
68163 Mannheim, Germany.  
E-mail: s.altmann@hs-mannheim.de  
\* Corresponding author

**Abstract:** Even though practitioners and scholars have highlighted the business potential use cases such as collaborative condition monitoring could bring into play, many firms shy away from pooling resources with other industrial peers in a platform environment. As of today, we lack a sufficient understanding why firms are skeptical and thus hesitant when it comes to using digital platforms for inter-firm collaboration to leverage value creation, e.g., based on machine data. To better understand this behavior, this research focuses on the challenges (potential) platform users perceive alongside a typical inter-firm collaboration process. We apply core elements of value proposition design to develop a guiding framework for an exploratory interview study among platform users. The expected insights will help us better understand which social and technical challenges future platform offerings need to address when and how to enable collaboration of peers.

**Keywords:** Digital Platforms; Platform Ecosystems; Inter-firm Collaboration; Collaborating Platforms; Collaborative Condition Monitoring; Socio-technical Systems; Inter-organizational Relationships

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### 1 Introduction

Fast growing digital platforms in a growing spectrum of businesses and markets, like Airbnb in accommodation, Uber in mobility or SIEMENS' MindSphere in the general industry, are a strong sign for their increasing relevance. Their success stories over the past decade have reorganized complete markets, redefined the scope of competition and triggered shifts in the economic balance of power unparalleled by any other technology driven business model (Kenney et al., 2019). Value is no longer created along linear value chains and scaled production of single companies, but in digitally enabled networks where organizations need to align and agree on joint requirements (Parker, Van Alstyne and Choudary, 2016). Digital platforms take advantage of network effects providing the basis for significantly increased value adding interaction (Teng, Tseng and Chiang,

2006). Pipeline businesses that have dominated industries for decades can potentially be replaced completely by platform-enabled businesses (Van Alstyne, Parker and Choudary, 2016). Consequently, the explosive and successful dynamics of digital platforms are receiving significant and still growing attention from practitioners in industrial organizations as well as scholars (Otto and Jarke, 2019; Trabucchi and Buganza, 2020).

The focus of previous studies has been on the design respectively the scaling of digital platforms and how incumbent organizations can manage the transformation process towards a platform-based business (Gawer and Cusumano, 2014; Rolland, Mathiassen and Rai, 2018). These studies offer extensive insights for platform owners and platform management. In comparison, we know little from the platform users' perspective (Rolland, Mathiassen and Rai, 2018). Details on their perspective and standpoint towards inter-firm collaboration in the era of digital platforms remain unclear (Oliveira, Lima and Lóscio, 2019). Although different scholars have stressed the potential that goes along with joining forces collaboratively for all market participants, today's and future platform users are in general very skeptic towards moving business resources and analytical capabilities to digital platforms (Aulkemeier, Iacob and van Hillegersberg, 2019; Bauer et al., 2020; Gelhaar and Otto, 2020). Instead, many industrial firms adhere to individual strategies and thus fail to leverage the potential of inter-firm collaborations based on pooled resources, like data or analytical capabilities (Gelhaar and Otto, 2020). Hence, use cases such as "collaborative condition monitoring" as brought up by one of the working groups of Plattform Industrie 4.0 yet remain conceptual ideas on a broad scale (Bauer et al., 2020). Our interview-based study aims to address this phenomenon by researching why industrial organizations so far exhibit great restraint towards inter-firm collaboration via digital platforms (Aulkemeier, Iacob and van Hillegersberg, 2019).

## 2 Theoretical Background

Digital platforms and corresponding ecosystems are understood as socio-technical systems (Kapoor et al., 2021). They form a place for value creation and act as intermediaries for value exchange between producers and consumers in multi-sided markets (Rochet and Tirole, 2004; Eisenmann, Parker and Alstyne, 2006; Gawer and Cusumano, 2014). Recent research agendas in the field of digital platforms asked for in-depth investigations regarding their design, successful scaling and how incumbent firms can manage the transformation towards a platform-based business (Gawer and Cusumano, 2014; De Reuver, Sørensen and Basole, 2018). Meanwhile, different digital platform scholars have reacted to this call and focused their attention on the successful implementation and scaling of digital platforms by attracting a critical mass of users and leveraging network effects (Trabucchi and Buganza, 2020). Numerous insights for digital platform owners on a successful scaling of their offerings have been revealed. What fell short is the digital platform users' perspective (Rolland, Mathiassen and Rai, 2018). Comparatively little attention has been devoted to put digital platforms into context with inter-firm collaboration (Oliveira, Lima and Lóscio, 2019). Following Mattessich and Johnson, we understand inter-firm collaboration as an employment of pooled resources, competencies and capabilities of two or more firms secured for a long-term effort in order to perform successful joint value creation (Mattessich and Johnson, 2018). The underlying principle is that "more is accomplished collectively than could have been

accomplished individually“ (Mattessich and Johnson, 2018, p. 79). Therefore, participating organizations and their leaders must be strongly committed to pursue agreed-on goals to jointly create new shared products and services (Mattessich and Johnson, 2018). Based on the literature of inter-firm collaborations, we see three major phases for a typical inter-firm collaboration process (Hoffmann and Schlosser, 2001; Kale and Singh, 2009): First, it starts with partner screening and selection, followed by the defining phase of the collaboration by agreeing on general principles and specific rules. Finally, collaboration between different actors runs, typically in form of a larger project which needs to be managed, monitored and reported.

### **3 Research Gap and Research Objective**

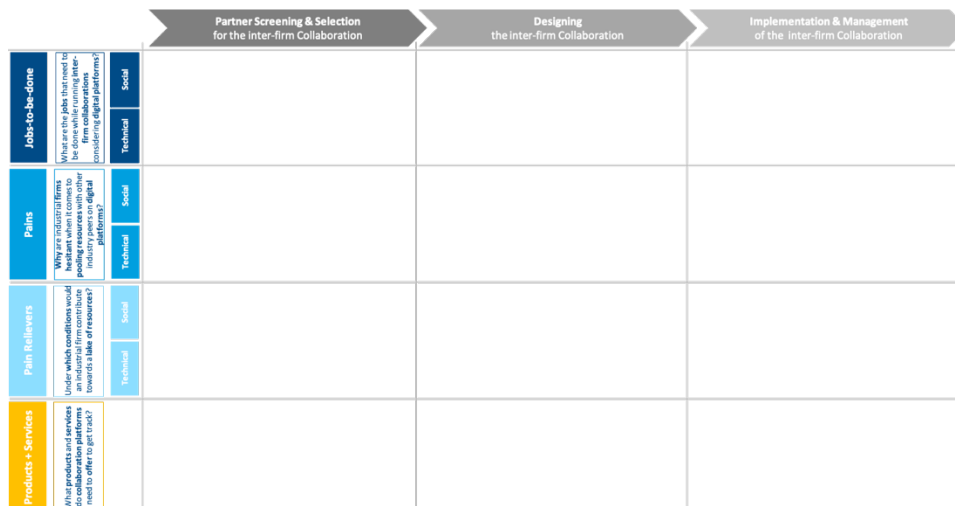
As of today, few studies have investigated the role of digital platforms in the context of inter-firm collaboration (Cremona, Lin and Ravarini, 2014; Oliveira, Lima and Lóscio, 2019). Consequently, we lack sufficient understanding why today's digital platforms are almost exclusively used for bilateral transaction-related purposes, i.e., cooperation and not for multilateral inter-firm collaboration. Numerous established industrial organizations may see the lever platform-based collaboration could offer, however the great majority of companies continue to limit themselves to bilateral cooperative data exchange (Oliveira, Lima and Lóscio, 2019; Bauer et al., 2020; Gelhaar and Otto, 2020). This study aims to investigate the phenomenon of companies' disregard for inter-firm collaboration on digital platforms by researching why industrial organizations so far exhibit great restraint towards pooling resources multilaterally and thus fail to leverage the opportunities available from collaborating with other ecosystem actors on and through digital platforms (Aulkemeier, Jacob and van Hilleegersberg, 2019; Oliveira, Lima and Lóscio, 2019). In this study we will not propose any technical solutions for collaboration platforms, instead we follow the call by Kapoor et al. (2021) by researching the social and technical challenges that inhibit platform users from thriving in a collaborative platform ecosystem. Considering the users to be the customers of such platform offerings, we want to understand what solutions they are missing on available platforms so far. Our study shall shed light on yet unaddressed challenges along a platform-enabled inter-firm collaboration process and at the same time propose first approaches when and how to address them best. Thus, we pose the following research question: Why do firms hesitate to demand and employ digital platforms for inter-firm collaborations?

### **4 Methodology**

First the literature on digital platforms, the respective ecosystem literature and inter-firm collaboration has been screened semi-systematically (Snyder, 2019), before a qualitative pre-study was conducted. In comparison to a systematic literature review this approach gave us the chance to get an overview of the two research streams although these topics have been “conceptualized differently and studied by various groups of researchers within diverse disciplines and that hinder a fully systematic review process” (Snyder, 2019, p. 335). As part of the pre-study, thirteen experts on the platform economy were interviewed on a semi-structured and exploratory basis between February and June 2020. These experts were selected carefully by considering the following sampling criteria: First, it has been ensured that the majority of firms covered with these expert interviews

have positioned themselves as users in at least one platform ecosystem. Second, only incumbents with different, complementary supply chain positions were considered. The interview guide deliberately included very open questions to gain a first overview in this under-researched field. Firstly, questions regarding inter-firm collaborations and its course were covered, before digital platforms, their role and current challenges in an inter-firm collaboration context were of interest. All interviews were recorded and transcribed for a qualitative content analysis (Mayring, 2000). New insights were then triangulated with the current state of literature and visualized in regular matrices (Miles and Huberman, 1984; Miles, Huberman and Saldana, 2019).

The insights gathered as part of the pre-study are intended to scope the future ambition of the research-in-progress. It will be of special interest to better understand the specific challenges industrial organizations currently perceive that prevent them from collaborating with others via digital platforms. This part of the in-depth study shall also be qualitative in nature by applying the problem-centric interview approach striving for a systematization of the platform users' perspective (Witzel, 2000; Döringer, 2020). A tentative interview guide has been conceptualized following the general logic of the value proposition design (Osterwalder et al., 2014). First, due to the social-technical nature of digital platforms we have a certain interest in the respective social and technical jobs-to-be-done from the (potential) platform users' perspective. Second, we focus the pain-relieving elements before we finally aim for an elaboration and first evaluation of potential conceptual solutions and their requirements which need to be served by specific products and services. Combining this approach with the processual logic of an inter-firm collaboration the following tentative guiding framework arises:



**Figure 1** Framework for designing the value proposition of collaboration platforms.

For applying and finally filling this framework we look out for established platform users that are in general willing to collaborate with others multilaterally but hesitate due to missing mandatory pre-conditions and requirements. The tentative framework, as shown in Figure 1, shall guide the interaction with our interviewees that will be characterized by

a semi-structured sequence of questions and answers. This approach suits best to the exploratory nature of the study, the large number of questions on a complex socio-technical issue where the adaptation of the “order and logic of questioning may need to be varied” (Saunders, Lewis and Thornhill, 2019, p. 445). The current state of research, however, only covers first steps in this direction.

## **5 Preliminary Results**

Our pre-study interviews revealed first challenges that will be investigated further along the logic outlined above. As of today, 15 challenges could be identified. Examples are the “lack of trust” between potential collaborators, “missing business models” or the current “management mindset” among potential collaborators. Current data reveals that there is a need of neutral platform offerings which can be interpreted as one pain reliever for lacking trust. To do so, various interviewees of our group addressed so far see spin-offs as a major necessity. The challenges identified so far may be subject to extension, systematization and aggregation within the scope of the in-depth study. We are excited to see if any and, if so, which of the given challenges are already addressed by today’s platform offerings within the scope of our in-depth study. So far unaddressed pains are in turn suspect to be at least one if not the explanation for the absence of collaboration platforms today. Moreover, the authors are curious about the standpoint of platform users who are in principle willing to collaborate via digital platforms but currently still face major challenges to actually do so.

## **6 Theoretical and Practical Contributions**

In this study, we follow Aulkemeier, Iacob and van Hillegersberg (2019) and others who encourage better understanding of the hesitant behavior exhibited by today’s and future platform users when it comes to inter-firm collaboration based on pooled business resources. Considering platform users to be the customers of such offerings, listening to them first and then understand their current attitudes and behaviors should be of major importance. Identified pain points may then be addressed in a correct and valuable manner. Yet, a gap exists in literature concerning the value proposition a collaboration platform needs to provide in order to meet as well as create demand for platform enhanced multilateral inter-firm collaboration. Our work contributes to this gap in two ways. First, the proposed framework combines the basic logic of the value proposition by Osterwalder et al. (2014) with the processual logic for alliance formation proposed by Hoffmann and Schlosser. Second, the resulting three-by-four matrix can be used to map the customer jobs, the thereby occurring pains and finally its pain relievers along a typical inter-firm collaboration process. Hence, our work will extend the short body of literature on digital platforms from a user perspective (Rolland, Mathiassen and Rai, 2018). Concurrently, this research will form the fundamental basis to conduct subsequent research on a collaborative business model approach, as Bauer et al. termed it in their result paper (Bauer et al., 2020).

From a practitioner standpoint, we expect to identify tangible managerial implications by elaborating on the skepticism of firms to consider digital platform offerings for inter-firm

collaboration. This study will provide a list of reasons and explanations for the absence of collaboration platforms and thus an explicit rationalization for platform users for not using digital platforms for collaborations in industry yet until the missing value propositions will be offered. At the same time, although the perspectives and interests of the platform owners are only considered parenthetically, they get assistance on which features need to be substantial part of future collaboration platforms. Moreover, platform owners can expect to get an overview of reasons which have limited the application of digital platforms to inter-firm collaboration on a relevant scale, so far.

## **7 Areas for Feedback and Development**

Although we screened the literature in the field of digital platforms and inter-organizational relationships carefully, we are thankful for any recommendations regarding scientific responses towards the calls for future research on ‘the general skepticism of organizations towards moving business resources to cloud platforms, [and] the willingness to share resources [...]’ (Aulkemeier, Iacob and van Hillegersberg, 2019, p. 607). Hearing about other research perspectives on digital platforms for inter-firm collaboration that we should consider is of great relevance to us. With respect to the proposed framework that shall guide our interview study we seek suggestions for enhancement and improvement. Here, we would be interested in interview strategies to reveal the real challenges potential users of platforms with collaboration purposes are facing. Currently, we are uncertain if references to practical initiatives like *International Data Spaces* or *GALIA-X* in the wake of the expert interviews could help here. Lastly, the authors would appreciate objective approaches to identifying platform experts beyond their job title and job description.

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