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Towards Platform Defined Business – Complementarity at the Spotlight

Abstract: As markets become increasingly more competitive firms systematically move away from hierarchical integrated supply chains toward fragmented networks of strategic partnerships with external partners. Business practice indicates a growing number of businesses relying on the platform organizational structures. For such constructs superior product quality and customer appeal maintain necessary but it is the breadth of the ecosystem of related product and services that has become a prerequisite for success. It implies the focus on third parties, complementors, who develop and deliver diverse content to platforms as well as enhance platform's generativity. Although complementary relations should be the main reference while considering the network dynamics from different angles, the attention in the extant research gravitates toward inter-platform competition with platform owners as the central object. Thus, with the objective to contribute to the emerging literature on industry platforms, this conceptual article discusses main challenges concerned with orchestrating arm's length relationships with complementors, by departing from platform-owner-centered approach and focusing on behavior of interdependent contributors.

Key words: digital platform, value capture, value creation, complements, boundary resources

JEL classification: M15, O32

Introduction

Structural transformation induced by a pervasive information and communication technology intertwined with global dispersion of supply chains has been labeled as a third globalization, a globalization reconfigured by digital platforms and the cloud [Kenney, Zysman 2016]. Algorithmically driven reorganization enables efficient conversion of broad human efforts and consumer assets into monetized goods. Observable rise of digitally defined businesses is gaining considerable scholarly attention across diverse fields of technology management, innovation management, strategic management, industrial economics [e.g. de Reuver, Sorensen, Basole 2017; Wareham, Fox, Cano Giner 2014; McIntyre, Srinivasan 2017]. On-going discussions gravitate toward technologically framed business choices that shape the competitive landscape, define the influence of variety of autonomous agents on value creation, delivery, and determine the range of control over the compensation for work performed by networks of value co-creators [Jacobides, Cennamo, Gawer 2015; Venkatraman et al. 2014]. It is argued that in the current competitive context superior product quality and customer appeal maintain necessary but it is the breadth of the ecosystem of related product and services that has become a prerequisite for success [McIntyre, Srinivasan 2017]. Hence, complementary relations are being brought up front while considering the interplay between value creation and value capture within the interfirm network [Schrieck, Wiesche, Krcmar 2017; Cennamo, Santalo 2013]. There is a growing body of literature on strategies for exploiting network effects, however rarely addresses the dynamic tension between inter- and intra-platform competition. Thus, with the objective to contribute to the emerging literature on industry platforms, this conceptual article discusses main challenges concerned with orchestrating arm's length relationships with complementors, by departing from platform-owner-centered approach and focusing on behavior of interdependent contributors.

Strategic management perspective on complementary relations

From the strategic management perspective organizations can create value in an "exclusive" manner by combining own internally developed resources and capabilities or "collectively" with the use of external resources and capabilities accessed through inter-organizational relationships [Lavie 2007; Najda-Janoszka 2016]. Extant research and observed business practice indicate however that firms are rarely able, or want, to perform all their activities in-house [Lavie 2007; Niemczyk, Stańczyk-Hugiet, Jasiński 2012; Czakon 2012]. Hence, firms engage in various inter-organizational constellations driven by

expectations of additional opportunities for value creation and capture that derive from the access to extended set of resources and capabilities owned/controlled by partners. Complementary resources provided by cooperating partners may directly contribute to firm performance through enrichment, strategic bundling, and/or absorption by internalization [Lavie 2007]. Moreover, participating in collaborative endeavor can generate synergies not only at the level of the resource base but also across activity systems [Ford et al. 2011]. However, potential additional benefits come with potential additional costs [negotiation, adaptation, maintenance, etc.] for parties involved. Evaluation becomes challenging as it involves a broader context of other business relationships of a given firm [Hakansson, Snehota 2005].

Other studies turned the attention to the importance of the access to complementary assets for successful implementation of innovations by discriminating between generic and specialized ones [Teece 2001]. It is argued that while acquiring generic assets usually does not cause major problems, gaining access to specialized complementary assets is more challenging and time consuming. Specialization of assets implies special purpose, irreversible investments that raise the risks for the engaged party. Thus, it is assumed that the control over complementary assets gains in importance with a greater degree of asset specialization. Further, the problem of in-sourcing innovative activity was addressed with an open innovation paradigm, according to which firms make a greater strategic use of external knowledge (outside-in approach) and simultaneously decide to externalize certain components of their intellectual property [Chesbrough 2003]. By opening up an innovation process to complementors [customers, suppliers, universities, competitors], a formerly protected know how becomes a means for knowledge exchange, which is expected to ultimately lead to additional monetary and strategic benefits [Dahlander, Gann 2010; Chesbrough 2003]. However, given that open innovation model does not imply externalization of all possessed knowledge assets, the main challenge concerns ability to simultaneously protect and share proprietary components of know-how [Dahlander, Gann 2010]. An appealing approach discussed in the literature implies aligning product architecture with intellectual property according to a modular design [Henkel, Baldwin, Shih 2013]. Extending modularization from physical production process to intellectual property allows for managing a right balance between systemic and autonomous innovations triggering product development. Although partners may innovate on modules, a focal firm maintains proprietary those areas of knowledge that are sensitive and necessary for innovating at the product architecture level [Henkel et al. 2013]. Hence, modularity is commonly recognized as one of the fundamental drivers of the rise of platform businesses [Hidding, Williams, Sviokla 2011].

Platform defined business activity

Based on the logic of a relatively stable core coupled with variable peripherals [Baldwin & Woodard 2009], platform can be seen as a vehicle for combining scale and scope economics together with product differentiation at the same time. Although platform logic is not new in the management field and business practice [Rochet, Tirole 2006; Jacobides et al. 2015], the astounding advances in digitalization enhanced potential and accelerated omnipresence of platforms in the current environment. Hence, the concept evolved from a vehicle for developing product portfolios serving different market needs [platforms bounded inside firms], to markets enabling direct transactions across different customer groups [two-sided, multi-sided platforms], and to industry level structures generating innovation through derivative applications, developed by external complementors (industry platforms) (Table 1).

Table. 1. Platform types

Category	Definition	Distinctive focus	author
Internal platforms	Internal system of production enabling recombination of components within the firm boundaries	Product family	Piezunka [2011]
Multi-sided platforms	Markets enabling direct transactions across different customer groups characterized by network effects between these groups.	transactions	Jacobides et al. [2015, p. 18]
Industry platforms	Building blocks [they can be products, services or technologies] that act as a foundation upon which other firms develop complementary innovations	innovations	Gawer [2009, p. 45]

Source: author's own work.

Observed fast diffusion of platforms across industries [e.g. telecommunication finance, transport, healthcare, tourism) refers to those last types allowing for capitalizing on network effects [Gawer 2014; Eisenmann, Parker, Van Alstyne 2011]. Given that multi-sided platforms and industry platforms bring together many user groups [end-customers, suppliers, third-parties – complementors) the value of those platforms increases with the number of users in the same user group (direct network externalities) as well as with the size of a different user group (indirect network externalities) [Katz, Shapiro 1994]. Such network dynamics leads to a basic premise that platforms expected to be popular end up more popular [Katz, Shapiro 1994], and to a generally predicted outcome labeled as “winner-take-all”, meaning that platform owners (holding property rights over platform) capture most of the value being created in the by participating parties [Cennamo, Santalo 2013].

Orchestrating networks of complementors

Businesses relying on the platform organizational structure have to manage the value creation and capture that occurs outside the company, in a broad network [Parker, Van Alstyne, Jiang 2017]. Thus, the main focus is on third parties, complementors, who develop and deliver diverse content (e.g. apps, plug-ins, extensions etc.), as platform growth is not limited by the necessity for developing proprietary assets [Parker et al. 2016].

Building on self-reinforcing effects of network dynamics there is a common agreed that the main mechanisms driving a platform's value are the increase in the installed user base and the availability of complementary assets [Cennamo, Santalo 2013]. Thus, striving to bring multiple sides on board as quickly as possible [Rochet, Tirole 2006], platforms encounter a key dilemma labeled as "chicken-and-egg-problem" [Caillard, Julien 2003] as getting interest of one side depends on the number of users at the other side. Platform owners, as property right holders, have the right to determine who can participate in the platform's network, determine the rules of the platform [Eisenmann, Parker, Van Alstyne 2006], but the relationship with complementors is distinct from the one with suppliers – instead of a principal-agent dependency there is an arm's length relation [Tiwana, Konsynsky, Bush 2010]. Hence, the important challenge for platform owners concerns an effective way for encouraging complementors users in the absence of formal roles and hierarchical control structures. Extant research highlight the need to empower complementors through orchestration that aims at defining core architecture and transfer design capability to complementors [von Hippel, Katz 2002]. Such transfer occurs through boundary resources defined as "software tools, regulations that serve as the interface for the arm's length relationship between the platform owner and the application developer" [Ghazawneh, Hendfridsson 2013, p. 174]. Hence, boundary resources are often referred to as central strategic tools for managing cooperation and competition in platform ecosystems. Recognizing the importance of boundary resources for understanding platform dynamics, some scholars argue that the point of attention should be shifted from the core of the platform to boundary resources [Hendfridsson, Bygstad 2013]. Nevertheless, transforming organizational resources into platform boundary resources requires time and effort, as well as it triggers competing concerns whether to keep a resource proprietary as a source of competitive advantage in a given market [Svahn, Mathiassen, Lindgren 2017]. Further, even though a platform successfully transformed resources into boundary ones, complementors may not necessarily use them in expected mode and scale. Depending on the complexity of the developed solution it may take time to utilize boundary resources in an efficient manner. According to Kapoor and Agarwal [2017], it is the platform specific experience gathered by complementors through the process of learning by doing (trial and error experimentation, accumulation

of new capabilities) that has a direct influence on their ability to sustain superior performance. Moreover, experienced contributors may use various strategies for exploiting boundary resources beyond the initially designed field, which may negatively affect the performance of the platform owner [Karhu, Gustafsson 2015]. Thus, a well thought-out cooperation in the process of developing boundary resources appears critical as well as a deep understanding the design and usage of boundary resources by both sides – platform owners and complementors.

An emerging literature on platforms have discussed various strategies enabling rapid growth of installed base of participants. Most of those propositions refer to variation in pricing [e.g. Hagiu 2005], subsidizing one side of the platform [e.g. Eisenman et al 2006], exclusive contracting [e.g. Armstrong, Wright 2007]. Existing studies provided interesting insights, however fragmented, since all those strategies have been investigated separately driven by the assumption that platforms introduce one dominant growth strategy at a time [Cennamo, Santalo 2013]. Addressing the gap, Cennamo, Santalo [2013] examined platforms implementing simultaneously two growth strategies aimed at managing complementary goods, one focused on improving content by stimulating competition among complementors, and the second focused on outcompeting rivals by securing exclusive platform applications. Obtained findings confirmed that combining different strategies for a rapid growth of networks generates strategic tradeoffs, which represent hidden constraints to “winner-take-all” approach. In result a narrow, intense focus on the network growth may instead undermine the very performance of a platform. Hence, there is a need for a more nuanced view on the intra-platform competition between complementors – as there is so many of them with often similar value propositions – and between the platform and complementors over the value created. There is a growing literature addressing the issue of inter-platform competition [e.g. Boudreau 2010; Eisenmann et al. 2011; Rochet, Tirole 2006], while the intra-platform competition remains relatively underexplored [Kapoor, Agarwal 2017; Tiwana 2015]. A recent study addressing this gap has examined interaction between value capture mechanisms used by platform owners and complementors’ incentives to co-create value in the platform network [Schrieck et al. 2017]. Authors identified three broad mechanisms used for capturing value:

- Absorption – platform owner extends the core with functionalities or whole applications formerly offered by complementors (acquisition, imitation, extension),
- Co-selling – platform owner support complementors in selling their products (bundling, branding, certification, customer enablement),
- Verticalization – platform owner develops and implements vertical use cases together with complementors (customization to specific industries).

The findings indicated both reinforcing (co-selling) and alleviating (absorption and verticalization) effects on value creation. Such insights inform the general debate on the degree of platform openness, defined through technological features as well as through the perception of current and potential complementors [Boudreau 2010]. Despite an open provision of boundary resources (module interfaces) the intra-platform competitive dynamics may restrict the perceived freedom for complementors [Schrieck et al. 2017]. The role of perception in the decision making by complementors is to a large extent unexplored research area. Further, the business practice has confirmed that openness comes with a price. Although a very high degree of openness encourage complementors and enhances platform's generativity, it intensifies intra-platform competition between contributors and also makes difficult to control all activities and outcomes in the network [Benlian et al. 2015; Casadesus-Masanell, Halaburda 2014].

Conclusions

A review of extant research provides an interesting picture for designing further studies on platform defined businesses. Available findings as well as arguments presented in several recent studies suggest a privileged position of platform owners in business structures as well as in the scientific inquiry. Complementors, although defined as critical to the value creation within the platform ecosystem, have received significantly less attention. Scholars tend to focus on strategies used by platform firms to attract complementors and to compete against other rival platforms. There are scarce studies that provide insights into the performance of complementors, used competitive strategies, their interrelations within the platform as well as with the other market agents. Lacking understanding of how complementors create and capture value may not be without significance for effective orchestration of platform activities. Moreover, as platform design businesses become more and more complex and highly digitized, they exhibit various innovation dynamics on different levels of their technical architecture. Each level may contain different components, hence different networks of complementors, although it is also possible that some complementors may bridge across those levels. Considering such complexity it becomes even more evident that complementors should receive more scholarly attention that embraces not only technical issues but also perception that underlies further decision process. Further, shifting from a platform ownership-centric perspective it could be also promising to focus more on the actual linkage between platform and complementors, and conceptualize platform dynamics in terms of distributed actors that collectively tune boundary resources. Such a shift can enrich the picture by providing opportunity to observe and analyze strategizing on both sides – platform owners and complementors.

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