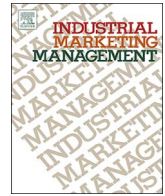




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The impact of digital technology on relationships in a business network

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ABSTRACT

This paper examines the impact of digitalization - the adoption of Internet-connected digital technologies and applications by companies - on B2B exchanges. While B2C exchanges are the subject of numerous studies on the transformations brought by the digital technologies, B2B exchanges are far less analyzed. Building on a conceptualization of exchanges between companies as made of activity links, resource ties, and actor bonds, this paper offers to identify three types of “digitalization” according to the nature of the most deeply impacted link. Five cases of digitalization in different industrial sectors and five companies providing digital solutions for businesses illustrate these three types. This typology provides an alternative to analyses based on the nature of digital systems used by B2B companies.

1. Introduction

Digital technologies are progressively transforming B2B companies which have now access to a wide range of digital systems that can manage - or help to manage - their interactions with different actors of their network (Richard & Devinney, 2005).

Yet, how these systems are changing - or have already changed - the relationships a company has with its customers, its suppliers or with other actors of the business networks remain still unclear. Obal and Lancioni (2013) wrote: “while a great deal of published research on customer–firm relationships in the Digital Age has focused on end users and consumer markets, much less research has dealt with the impact of digital communications on the relationships between buyers and suppliers in industrial marketing.” (p. 851). The nature of change, the impact on business relationships and the problem identification related to these changes require appropriate theoretical lenses fine-tuned for a B2B context.

The aim of this work is to understand how digital technology impacts relationships into a business network and, consequently, how value is co-created by actors in the digital era. We define digital transformation as the digitalization of previously analog machine and service operations, organizational tasks, and managerial processes (Iansiti & Lakhani, 2014) in order to drive new value for customers and employees and more effectively compete in an ever-changing digital economy (Solis, 2017).

Our paper will be organized as follows. In a theoretical section, we show how the digitalization phenomenon refocuses attention on coordination and how a network approach is adapted to observe it. We

use the literature on the actor – resources - activity model (Hakansson & Johanson, 1992; Hakansson & Snehota, 1995) to identify how changes in a network can be described in terms of changes at the level of activity links, resources ties, and actor bonds. We then describe five cases of digitalization in a B2B context and analyze them according to which of the actor, resource or activity layer of the B2B exchanges is impacted the most by the digital technology. Based on this analysis we propose a possible typology of these digital changes. Theoretical and managerial implications are developed.

2. Theoretical background

2.1. A network approach of the business relationships digitalization

Due to the complex nature of the digital market no single actor can provide a service to the customers with an end-to-end solution on its own, there is a need to sustain viable alliances and to create a value network with the right partners (Barnes, 2002; Canhoto, Quinton, Jackson, & Dibb, 2016; Pigneur, 2000; Sabat, 2002). Partnership management capabilities (Dyer & Singh, 1998) will have to be a core competence that new business actors must possess (Pigneur, 2000). Digital technologies are also transforming the structure of social relationships in both the consumer and the company space (Orlikowski, 1992). Furthermore, we need also to consider that products and services increasingly have embedded digital technologies (i.e. connected car or smart house appliances), and it is becoming more difficult to disentangle business processes from their underlying IT infrastructures (e.g., El Sawy, 2003; Orlikowski, 2009).

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In this respect, some scholars (Fine, 1998) have proposed to address the challenge of the digital transformation following the “three-dimensional concurrent engineering” framework adding value chain engineering to augment the traditional two-dimensional concurrent engineering of products and processes (Fleischer & Liker, 1997; Nevins & Whitney, 1989; Ulrich & Eppinger, 1994). This framework focuses on the need to engineer a value chain *simultaneously* with the engineering of the products/services and processes for providing value. Significant value can be created assessing the value of relevant knowledge residing at different points in the network and arranging its transfer to other points in the network where it is needed (Doz, 1996; Gulati, 1999). This implies exploiting resources that are made available through the network relationship (Gulati & Singh, 1998; Inkpen & Dinur, 1998; Kale, Singh, & Perlmutter, 2000; Khanna, Gulati, & Nohria, 1998).

Digital business strategies are then calling for coordination across firms along product, process and service domains, thereby creating complex and dynamic ecosystems for growth and innovation (Iansiti & Lakhani, 2014). The whole value network is underpinned by a particular value creating logic and its application results in particular strategic postures. Adopting a network perspective (Burt, 2004; Gulati, 1995; Kogut & Walker, 2001; Marsden & Podolny, 1990) provides an alternative perspective that is more suited to organizations, particularly for those where both the supply and demand chain are digitized (Peppard & Rylander, 2006).

In recent years, there has been considerable discussion and research about the impact of digital business strategies on the evolution of supply chains into value networks and value constellation or ecosystems (Iansiti & Lakhani, 2014; Pagani, 2013). The concept of “value network” has constituted a shift between a traditional vision of value creation anchored in a value chain perspective (Porter, 1985) to a renewed vision of value creation supported by the network perspective (Kothandaraman & Wilson, 2001; Möller & Rajala, 2007; Parolini, 1999).

Möller and Rajala (2007) building on Parolini (1999) precisely link the value network to a specific conception of how value is created and base the notion of value network on the idea that “each product/service requires a set of value creating activities performed by a number of actors forming a value-creating system”, there the value network. Bitran, Bassetti, and Romano (2003), define a value network as one in which a cluster of actors collaborates to deliver value to the end consumer and where each actor takes some responsibility for the success or failure of the network. This framework agrees with the concept of value constellation introduced by Normann and Ramirez (1993). According to this perspective, the value-creating system is composed of different economic actors who work together to co-produce value.

If value network has emerged as a central concept for research in digital contexts, scholars in industrial marketing have for a long time now promoted the use of a network approach to the study of B2B exchanges. This is the case with the Industrial Network Approach or markets-as-networks approach (Gadde, Huemer, & Håkansson, 2003; Håkansson & Snehota, 1995; Johanson & Mattsson, 1992; Mattsson, 1997) associated with the Industrial Marketing and Purchasing (IMP) Group. But, as far as we know, the network approach of markets has not been discussed with a purpose of reporting on the general transformation of markets due to digital technologies.

2.2. Business relationships changed by digitalization: an Actor–Resource–Activity perspective

The above-mentioned works all contend the idea that digitalization is profoundly changing the way business is carried out between companies. One important underlying dimension of the digitalization movement as analyzed by scholars is that it clearly refocuses on *coordination* between companies. Peppard and Rylander (2006) already emphasized more than a decade ago the impact of digitalization on the

decline of transaction costs (whether transactions happen *within* or *between* companies). In such situation, when the access costs to external resources are low, the “integrated firm” is not offering any kind of specific benefit. Identifying external resources and having access to them becomes then the central issue. An issue that can be raised in terms of “coordination between companies”. More recently, Iansiti and Lakhani (2014) reaffirmed “coordination between companies” as a central issue with digitalization that is not a topic of “*displacement and replacement but connectivity and recombination. Transactions are being digitized, data is being generated and analyzed in new ways, and previously discrete objects, people, and activities are being connected*” (p. 93).

We thus build on the idea of the centrality of the coordination issues when dealing with digitalization and propose to use a framework that allows a detailed understanding of how companies get connected. The Actor–Resource–Activity model (Håkansson & Johanson, 1992; Håkansson & Snehota, 1995) provides the adapted framework.

The ARA model suggests that a business exchange can be described in terms of three “layers”: activity links, resource ties and actor bonds (Håkansson & Snehota, 1995). The model is able to capture “the complex connections between activity coordination and resource combining and the subsequent impact on the actor structure” (Mattsson, 2002, p. 169).

ARA considers an activity as a “sequence of acts directed towards a purpose” (Håkansson & Snehota, 1995, p. 52). For instance, “developing a product”, “purchasing”, “selling”, “processing information”... are considered activities.

Resources sustain activities. Activities can be raw materials, physical facilities, components, operating systems, products... in short, “various elements, tangible or intangible, material or “symbolic”, can be considered as resources when use can be made of them” (Håkansson & Snehota, 1995, p. 132). Then, Håkansson and Waluszewski (2002) classify resources into four types: products and production facilities (which are both considered as *technical/physical* resources); organizational units and organizational relationships (which are considered *social* resources).

Actors interact with others to combine resources and link activities (Lenney & Easton, 2009). Actors in the ARA model can be individuals or organizations. The fact that a company can be considered an actor is to be linked to the idea that a company acquires an identity interacting with others (and not only because companies are considered – just like individuals - able to form intent, have purposes, be an agent).

Based on the above-defined “activity”, “resource” and “actor” concepts, any B2B relationship can be described following the way activities resources and actors are connected between firms. First, companies are connected by *activity links*, which concern technical, administrative, commercial and other activities of a company that can be connected in different ways to those of another company as a relationship develops. The rationale for more adjustments between activities is clearly expressed as a gain in functionality: “the more adjustments, the more fine-tuned the two [activities] become in relation to each other and the better their performance” (Håkansson, Ford, Gadde, Snehota, & Waluszewski, 2009, p. 98). Yet, an excess of “linking” can also be detrimental as it impedes an activity to be reconfigured when new conditions arise (Håkansson et al., 2009, p. 127). At the level of the network, these connected activities shape an activities pattern.

Companies are also connected through *resource ties* that connect together various resources. Resource tying is the source of innovation: “resource ties cause some innovation in the use of resources and are important to the innovation potential of the company” (Håkansson & Snehota, 1995, p. 188). Yet, an excess of “tying” can have negative consequences by creating difficulties for the resource to be redeployed in a combination with other resources. At the network level, these connected resources form a resources constellation.

Finally, companies are interconnected through actors bonds that form a web of actors at the network level. Actors bonds are an important means for a company to mobilize other resources. Tightening bonds with a counterpart support a better access to information and

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