



The strategic value of data resources in emergent industries

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ABSTRACT

In this paper we examine the strategic role of data resources in emergent industries. We contrast the resource-based view and the relational view theories to examine how data resources can help organizations create and capture value. We compare two organizations from two different industries to understand how different types of data resources can provide a competitive advantage. We also examine the role of strategic partnerships in capturing value created through the exploitation of data resources. We conclude that while data often serve as a required resource for entry into new markets, strategic partnerships play a critical role in capturing value created through the exploitation of data resources. The emergent partnership structures are remarkably similar across the two organizations. They target rapid market expansion through encapsulation of data resources within highly scalable web services and the use of standardized legal contracts. We also find that temporal decoupling between value creation and value capture can expose firms to the erosion of the competitive advantage gained through investment in data resources.

1. Introduction

The question of information technology (IT) contribution to organizational success is one of the central themes in Information Systems research (Melville, Kraemer, & Gurbaxani, 2004) and there is an active polemic on the role of IT in the formulation and execution of business strategy (Lepak et al., 2007; Rai et al., 2012; Saunders & Brynjolfsson, 2016; Wade, 2010). Data resources are generally viewed as an important organizational IT resource (Fisher, 2009), however there has been relatively little work examining *how* data resources contribute to value creation and capture in the context of *emergent industries* which are characterized by environmental turbulence and a lack of dominant business models. Data resources often require a significant investment in IT infrastructure and management costs. Understanding how data resources can provide a competitive advantage would help in the organizational strategy formulation and investment decisions (Xu, Zhang, & Li, 2016). These decisions are particularly important in the context of new ventures within emergent industries that are typically resource-constrained and have little room for strategic missteps (Gibbert, Hoegl, & Välikangas, 2007).

We draw on research in the developed industries as a starting point for the evaluation of how data resources can contribute to value creation and value capture in the emergent industries. Extant research on how IT creates value for a firm has been done from either the internal or the external perspectives. The internally focused view emphasizes the

role of unique organizational processes and resources in establishing a competitive advantage in a given market. The externally focused view emphasizes the role of inter-organizational partnerships in value creation. To understand how data resources are used and how they contribute to the organizational success, we draw on two theories widely used in the studies on IT value. The resource-based view (RBV) of the firm supports the internal view, and it posits that certain organizational resources, if maintained and used wisely, can provide a sustainable competitive advantage (Barney, 1991, 1995). The relational view (RV) of the firm supports the external view, and it posits that partnerships and cooperation among the firms as well as sharing resources are the keys to the inter-organizational competitive advantage (Dyer, 2000; Dyer & Singh, 1998). The RBV and RV theories make different recommendations for the strategic approaches to data resource exploitation in the context of developed industries and we evaluate the applicability of these theoretical perspectives in the context of emergent industries.

The necessity to evaluate the role of data as an IT resource in value creation is pertinent with the emergence of big data as a powerful resource that enables new business models and changes the ways companies do business (Chen, Chiang, & Storey, 2012). With the advances in technology and continually declining cost of computing and storage, firms are able to collect and store ever-growing volumes of data that have the potential to unlock new business opportunities. The new data resources bring a fundamental transformation to the creation of

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business value, requiring a re-examination of the contribution of data resources to value creation across different emergent industries. For example, digital marketing is powered by the behavioral consumer data captured across the web and mobile devices. These data enable precise targeting of individual consumers with specific advertisements related to consumer interests and preferences inferred through the digital tracks left by the consumers online. The opportunity to target individual consumers more accurately has accelerated the shift of marketing budgets to digital advertising and it is reshaping the marketing industry (CMO Council, 2015).

The following research questions are motivating our study:

How do firms leverage data resources to create and capture value within emergent industries?

What do emergent industry practices reveal about the potential gaps in established theoretical perspectives on the strategic value of data resources?

To address the value of data, we contrast the resource-based view and relational view of the firm using two case studies. The case studies examine two organizations in two different emergent industries and different types of data resources. This comparison is valuable because it contributes to the theoretical basis for our understanding of how data can impact value creation and how firms capture this value. We find that the emergent industry practices differ from the predictions of both RBV and RV theories. The companies in our study are neither exclusive in exploiting data resources (as predicted by RBV), nor develop open collaborations (as predicted by the RV theory). We discuss the emergent patterns of data resource exploitation that allow the firms to maximize the value of their data resources. Further, we also discover that temporal decoupling between value creation and value capture can undermine a firm's ability to capture value created through exploitation of data resources uncovering a critical condition for realizing the potential value of data resources.

The paper is organized as follows. The next section introduces the resource-based view. It also discusses data resources and the attributes that differentiate data from other types of IT resources. Then a relational view of the firm is introduced. This is followed by the presentation of two case studies and a critical comparison of these case studies from the RV and RBV perspectives. We conclude with a discussion of emergent industry practices and insights, contributions to theory and practice, limitations and opportunities for further research.

2. Theoretical background

2.1. The resource-based view of the firm

The resource-based view of a firm emphasizes the role of organizational resources in providing a competitive advantage (Barney, 1986, 1991, 1995). RBV suggests that firms possess two subsets of resources. The first subset enables firms to achieve a competitive advantage, and the second subset leads to a greater long-term performance (Barney, 1995; Wade & Hulland, 2004). For the organizational resources to be valuable, they have to be rare and appropriable to provide a firm with a competitive advantage. The advantage can be sustained for longer periods of time if the firm manages to protect the resources against imitation, transfer and substitution (Wade & Hulland, 2004).

One of the challenges in the resource-based view theory is the lack of a clear definition of an IT resource (Wade & Hulland, 2004). Ross, Beath, and Goodhue (1996) defined information systems resources as a set of three assets: human assets, technology assets and relationship assets. Powell and Dent-Micallef (1997) split information systems resources into three groups: human resources, business resources and technology resources. Feeny and Willcocks (1998) identified four IS capability areas linked to business, technical and interpersonal skills. These areas included business and IT vision, IT architecture design, information services delivery and information systems leadership. Bharadwaj (2000) offered a measure of IT capability that consisted of

six dimensions: IT business partnerships, external IT linkages, business IT strategic thinking, IT business process integration, IT management, and IT infrastructure.

Wade and Hulland (2004) grouped resources into either assets, tangible and intangible resources that can be used in producing goods and services, or capabilities, actions used to create goods and services. In Information Systems, assets may include hardware, software, networks, and infrastructure; whereas capabilities can include managerial skills and processes, such as systems development and integration (Wade & Hulland, 2004). Tangible IT assets are considered the easiest resources to copy, and therefore they are least likely to provide a firm with a source of sustainable competitive advantage. Meanwhile, capabilities and intangible assets are harder to imitate (Reed & DeFillippi, 1990) and they can drive the firm's performance (Teece, Pisano, & Shuen, 1997).

Data resources are different from other IS resources used in resource-based research such as hardware, software, networks, and IT infrastructure (Wade & Hulland, 2004). Levitin and Redman (1998) analysed data as a resource and found that data have unique characteristics. Unlike other resources, data are shareable, and they can be utilized by many users at the same time, while producing different information products. Data are copyable and transportable, and considering the speed of transferring digital files, data can be transported efficiently. Data are non-fungible, meaning that although we can substitute one dataset with a similar dataset, we cannot substitute one data item with another data item because data items are unique. Data are versatile and can be used for many different purposes. Data are also characterized by depreciability. However, unlike other resources, data depreciates not from inevitable wear and tear, but from time. Newer data can have more relevance than old data, although data mining techniques can reveal interesting patterns in historical data. In addition, unlike many other resources, data are renewable and new data can be collected and analysed all the time (Levitin & Redman, 1998).

2.2. The relational view of the firm

In contrast to the resource-based view, which suggests that the source of competitive advantage is contained within the firm, the relational view argues that a firm's critical resources may extend beyond the firm's boundaries. In other words, firms that combine their resources in certain ways may realize an advantage over competing firms that are unable or unwilling to create partnerships (Dyer & Singh, 1998).

According to Dyer and Singh (1998), the competitive advantage of partnerships is based on four components. First, firms need to invest in relation-specific assets. Second, they should establish knowledge exchange and joint learning (Chuang & Lin, 2015; Youn, Yang, Kim, & Hong, 2014). Third, firms should combine their complementary resources and capabilities, especially if they are scarce, to create new products and services. Fourth, firms should promote effective governance mechanisms.

Grover and Kohli (2012) expanded the relational view by applying it to the IT context in a form of four layers. The asset layer involves specific IT skills or assets that enhance the relationship between firms. The knowledge layer is powered by common knowledge sharing platforms and analytics. The capabilities layer involves unique IT skills, and the governance layer provides effective management of the other three layers.

Focusing on the IT value, some layers may have more importance than others depending on the context. For example, Ceccagnoli et al. (2012) examined the partnership between platform owners and vendors participating on the platform. They found that in order to create value, this partnership focused on the asset layer and integrated IT assets to create network effects and provide more functionality on the platform. Ceccagnoli and Forman (2012) examined the role of a set of IT functionalities in the relationship of a supplier with multiple buyers and

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