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The Strategic Role of Data Resources: Two Case Studies from SMB Financing and Advertising Industries

Completed Research Paper

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Abstract

In this paper we examine the strategic role of data resources. We contrast the resource-based view and the relational view theories to examine how data resources can help organizations create and capture value. We use two case studies 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 exploitation of data resources. We also find that the emergent partnership structures can be remarkably similar in different industries. The emergent structures target rapid market expansion through the use of standardized legal contracts and encapsulation of data resources within highly scalable web services.

Keywords: Big data, data resource, relational view, resource-based view, partnerships, competitive advantage

Introduction

The question of information technology (IT) contribution to organizational success is one of central themes in Information Systems research (Melville et al. 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; 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 across different industries and the published work has been largely descriptive (McAfee and Brynjolfsson 2012; Woerner and Wixom 2015). 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. This is particularly true in the world of big data that is characterized by the increasing data availability (Chen et al. 2012).

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 co-creation. To understand how data resources are used and how they contribute to the organizational success, we compare 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 and Singh 1998; Dyer 2000).

The necessity to re-evaluate the role of data as an IT resource in value creation stems from the emergence of big data, a powerful resource that enables new business models and changes the ways companies do business (Chen et al. 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 business value, requiring a re-examination of the contribution of data resources to value creation across different industries. For example, digital marketing is powered by the behavioural 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? What do the 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 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.

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 a presentation of the two case studies and a critical comparison of these case studies from the RV and RBV perspectives. We conclude with a discussion of the contributions to theory and practice, limitations and opportunities for further research.

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 greater long-term performance (Barney 1995; Wade and 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 and Hulland 2004).

One of the challenges in the resource-based view theory is the lack of a clear definition of an IT resource (Wade and Hulland 2004). Ross et al. (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 et al. (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 and 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 and DeFillippi 1990) and they can drive the firm's performance (Teece et al. 1997).

Data resources are different from other IS resources used in resource-based research such as hardware, software, networks, and IT infrastructure (Wade and 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 and Redman 1998).

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 firm 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 and 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. 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 found that the complementary resources and knowledge sharing were the most instrumental factors in co-creating value.

Data resources can be classified as a shareable asset. Data can be easily shared with partners, however similar to other relationship-specific assets, data have to be safeguarded to avoid opportunism, as suggested by Dyer and Singh (1998). Data are a useful resource to establish input for knowledge exchange and learning, and can be used for the development of new products, services and processes. Data can interact with complementary resources, such as additional datasets and analytics, and become a source of value that a partner could not capture individually. The governance focuses on promoting value creating initiatives such as investing in relation-specific assets, sharing knowledge or merging complementary resources (Dyer and Singh 1998). Thus, the effective governance mechanisms may allow partners to make greater investments in relation-specific data resources; credibly assure partners that knowledge produced based on data resources will not be easily shared with others, and complementary resources will not be copied or duplicated.

The resource-based view and the relational view perspectives offer distinct recommendations on how firms should leverage data assets to create and capture value. On the one hand, the RBV perspective suggests that firms are best served by exclusively exploiting their data resources and safeguarding wherever possible from potential imitation and substitution. The relational perspective suggests that firms need to leverage existing resources to establish partnerships with other market participants that would help the firms to create and capture value. To ascertain the validity of the predictions of the two competing perspectives, we conducted two case studies focusing on two emergent data-intensive industries.

Research Design

The question of how data resources affect organizational success requires the assessment of a broad set of contextual and organizational factors. Case study methodology is a recommended approach for the study of complex phenomena in real-world contexts (Eisenhardt 1989; Yin 1994). The two case studies presented here focus on two different industries: small and medium business financing and online display advertising industries. The case study selection is driven by three key considerations. First, we are focusing on two emergent industries that have significant practical implications. Second, we are examining two industries in which data resources play a key role in value creation. Third, we purposefully selected two structurally very different industries in order to expand our potential to capture unique patterns of strategic data exploitation.

The results and analysis presented here is a part of an on-going research program that began in 2013. The data presented here cover the period between November 2013 and July 2015. In order to maximize the internal validity of the case studies, we triangulated across multiple sources of information. We interviewed the company executives, and reviewed regulatory filings and other materials shared by the companies. Wherever it is possible, we provide references to publicly available documents that serve as a supporting source of evidence for our inference from the interviews. Due to the potentially sensitive nature of some of the information that was shared by the executives during the interviews (publicly traded companies generally limit information disclosure), we do not identify the specific sources in the manuscript unless the stated information is publicly available. For the online display advertising case study, we also interviewed the executives from competing companies to further expand our understanding of the key industry practices.

| Case study | Data sources |
|----------------------------|--|
| SMB Financing | <p>Primary data sources: Several rounds of interviews with senior executives in November 2013, March 2014, March 2015, June 2015.</p> <p>Secondary data sources: OnDeck Capital S1 Statement, OnDeck Capital Annual Report 2014, OnDeck Capital Investor Presentation, Q1, 2015.</p> |
| Online Display Advertising | <p>Primary data sources: Interviews with executives in display advertising industry, December 2013, April 2014, April 2015.</p> <p>Secondary data sources: Criteo Annual Report 2014, Criteo Investor presentation Q1, 2015.</p> |

Table 1. Data sources

Below we present a brief overview of the emergent market structures in the respective industries. In each case, we focus on the role of data resources in providing the initial and the sustainable competitive advantages for the leading companies in the respective industries. Following the recommendations for “best practices” in case study research (Yin 1994), we conclude with a comparative discussion on the role of data resources and IT-enabled partnerships as the critical sources of the initial and the sustainable competitive advantage in each industry.

Cases

Case 1. Alternative SMB Financing Industry

The 28 million small and medium size businesses (SMBs) provide nearly half of all jobs in the private sector in the United States and contribute about 48% of the gross domestic product (Small Business Administration 2012). SMB owners often face challenges in obtaining financing from traditional banks for several reasons. First, SMB owners are typically time and resource constrained. Data from the Federal Reserve Bank of New York shows that obtaining a SMB loan from a traditional bank requires on average 33 hours and the submission of loan applications to three banks (NYFRB 2014). SMB owners can seldom afford the time required to apply for a traditional business loan. For those business owners, who manage to navigate the SMB loan application process at the traditional banks, the loan decisions are often negative. This is in large part due to the difficulty of assessing creditworthiness of the diverse types of SMBs operating in different industries, geographies, and having different operating histories. Traditional banks commonly rely on the owners’ individual credit scores to base the SMB lending decisions (Experian 2015). SMB owners frequently use their personal credit cards as a source of working capital. Consequently, higher than average typical monthly credit card balances negatively affect individual SMB owners’ credit scores, undermining their ability to qualify for a traditional loan (Holmes 2013). As a rule, SMB owners struggle to obtain loans from traditional banks and this undercuts SMB growth potential and it has a negative impact on the overall economy.

Oliver Wyman, a management consulting firm, estimates the unmet demand in the SMB financing industry at \$80-\$120 billion (Carroll and Hoffman 2014). This presents a tremendous business opportunity. The evolution of the Internet as a business-to-business (B2B) service channel offers a novel conduit for acquiring and servicing SMB loans by non-traditional lenders. However, the challenge of assessing SMB creditworthiness requires the development of a novel approach to credit scoring. OnDeck Capital is among the leading companies in this space. The company was founded in 2007 to specifically focus on SMB lending (OnDeck 2014). The company built a proprietary credit-scoring model leveraging transactional business bank account data as the key source of information about SMB creditworthiness. Intuitively, this approach makes perfect

sense. SMB ability to repay a loan is directly dependent on the free cash flow generated by the business. The bank accounts provide a reliable third-party source of this information.

Traditionally, obtaining the transactional bank account data was relatively difficult. SMB bank statements were typically provided to SMB owners in hard copy and converting paper bank statements into usable data required a significant effort. Fortunately for the early players in the non-traditional SMB lending space, another innovative firm made it much easier to obtain electronic copies of transactional bank account data. Yodlee, an innovator in the financial industry, developed a cloud based financial institution management platform that is being used by 9 of the top 15 largest banks in the United States (Yodlee 2015). Among other services, Yodlee provides real-time access to transactional data in business bank accounts. The information can be retrieved in seconds, provided that the account owner authorized the disclosure. OnDeck partnered with Yodlee and built a proprietary credit scoring model based on the financial transactional data captured in the bank accounts. Instead of focusing on the personal SMB owners' credit scores, OnDeck assesses the financial health of the applicant SMBs reflected in the transactional business bank account data (OnDeck 2014).

OnDeck faced a significant cold start problem in assessing SMB loan credit risk. To assess the creditworthiness of a new SMB loan application, the company needed to have past loan performance data that could be used to predict loan repayment. To gather the data necessary to build the credit-scoring model, OnDeck collected industry, financial and geographic data about the businesses that applied for loans. To determine the outcome of individual lending decisions, the company needed to risk its own capital and issue loans to the SMBs applying for credit. According to the company, the average value of a loan issued by the company is \$35,000 (OnDeck 2014). This means that the company risked \$70 million in capital to collect just 2000 records to build the initial credit-scoring model.

OnDeck went public in December 2014 and the company shared its operating performance results with the investors in the pre-IPO disclosures. OnDeck announced that in the period between 2007 and 2014, the company had issued over 27,000 SMB loans with the combined value over \$1.2 billion (OnDeck 2014). The collected data presents an invaluable data resource underpinning OnDeck operations. Our discussions with the company senior management revealed that the first version of the credit-scoring model built by OnDeck in 2008 could not evaluate creditworthiness of more than 35% of loan applications – the company simply did not have enough historical data to assess the risk. OnDeck Capital reports that the fifth version of its credit-scoring model can evaluate 99% of the applications that the company receives (OnDeck 2015).

Being the first mover in the alternative SMB financing space afforded OnDeck the opportunity to gain the initial advantage over the later entrants into the market by building the key intangible data asset (past SMB loan performance data) that underpins the company ability to reliably assess SMB credit risk. This early advantage also offers the benefit of the virtuous information cycle (Aral et al. 2006). The ability to reliably assess credit risk gives OnDeck an advantage in establishing a profitable underwriting business and consequently attracting external capital at lower rates (OnDeck 2015). Successful SMB loan underwriting generates more data that improves the quality of the model supporting the underwriting decisions. Given the initial advantage developed by OnDeck, one would expect that the company place in the SMB financing space would be secure. However, the company IPO filing also had unintended consequences.

OnDeck pre-IPO disclosures (OnDeck 2014), that were released in the third quarter of 2014, revealed the attractiveness of the alternative SMB lending business to other potential market participants. Shortly following the disclosures, a new set of players entered the SMB financing market. Many of these players came from the personal loan industry (Lunden 2015). The personal loan businesses lend to individuals. Personal loan risk assessment is typically based on individual factors (individual credit score and verifiable income) (Wells Fargo 2015). The personal loan industry attracted regulator attention for potentially abusive practices in so called “payday loans”.

The “payday loans” were saddling lower income individuals with high interest loans that were effectively impossible to repay (Younker 2015). The regulatory scrutiny that threatened the traditional personal lending business model forced the major players in this industry to search for new sources of revenue. Consequently, a number of the “payday loan” companies rebranded themselves as SMB loan providers (Lunden 2015). Without the benefit of historical loan-performance data and driven by the voracious appetite for new revenue, the new players in the SMB financing space often offer terms to potential clients that are not supported by any financial business performance records provided by the applicants. In a recent conversation, a senior OnDeck manager lamented that he experienced many cases where applicants rejected OnDeck loan offers after receiving seemingly “too good to be true” terms from the personal loan companies that appear to underestimate the apparent default risk. The new competition is undermining OnDeck margins. OnDeck 2014 Annual Report states that “the fourth quarter of 2014 marked our eighth consecutive quarter of price reductions as we continue to pass savings along to our customers”, reflecting the growing competition in the SMB financing space (OnDeck 2015).

Evaluating the SMB financing industry from the RBV perspective, it is clear that the historical loan performance data are a key data asset in the industry. Acquiring even the minimum dataset to build a predictive credit default model requires a significant investment of time and capital. Time is required to evaluate loan performance over a period of time. SMB loans are typically 6 months to 2 years in duration. The development of this data asset provided OnDeck with the initial advantage in the SMB financing industry. However, the early mover advantage gained by the company is threatened by imitators that may risk financial capital without the requisite risk assessment of loan applications. The consequences of this type of competition is that the value created by the lenders employing informed credit-risk assessment models is competed away through better financial terms available to potential borrowers from less informed lenders in the industry. The end result of the competition is difficult to predict as either of the following scenarios may play out. It is possible that the less informed lenders will start to fail under the weight of the loans that default. It is also possible, that while the less informed lenders will take heavy financial penalties for their early bad loans, the ones that survive will collect sufficient historical loan performance data to build good credit risk models and become informed competitors going forward.

In the ongoing competition, the main objective of both well-informed and poorly-informed market participants is to gain as much market share as possible. In this environment, partnerships with companies that can offer access to the SMB owners is very important for the long term success. Recognizing the importance of such partnerships, OnDeck developed a platform that allows small business consultants to offer SMB loans to their clients in exchange for a fee. OnDeck has also signed an agreement with Intuit, the maker of popular QuickBooks accounting software used by many SMB owners. The strategic partnerships supported through IT platforms will allow OnDeck to reach their target audience and they will likely prove to be the critical strategic asset in defining long-term company success. Figure 1 summarizes the key data resources and industry participants in SMB financing.

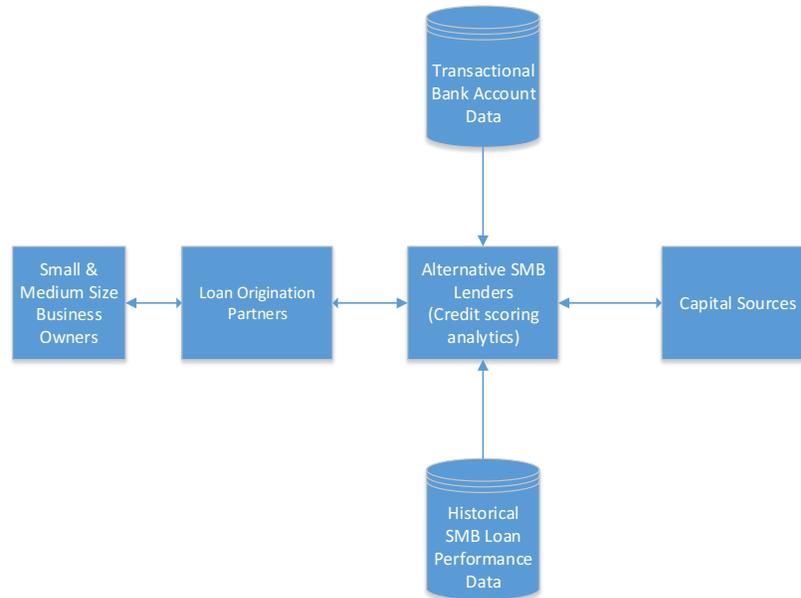


Figure 1. Alternative SMB Financing Industry Structure

Case 2. Online Display Advertising Industry

Online display advertising industry focuses on solving the challenge of connecting the right prospects (consumers) with the right product (brand) at the right time and with the right offer. While the challenge of connecting the right prospect with the right brand is not unique to online advertising, online consumer behaviour is particularly well suited for solving this challenge computationally. Accurate predictions of consumer interests benefit all market participants. When the right match is made, consumers are exposed to the ads that are relevant to them individually and the advertisers can significantly improve the return on their investment in advertising. To achieve these goals, consumers are routinely tracked online by many data aggregators that monitor consumer activity across popular web sites by placing cookies (unique identifiers) on consumer computers. While the online consumer tracking is generally done anonymously, it is often possible to identify consumers personally through their online behaviour and even to connect online behaviour with offline activities (e.g. purchases at specific retailers) (Rijmenam 2015). Such wealth of information about the online and offline consumer behaviour can be instrumental in optimizing the advertising messages shown to individual consumers online.

Online marketing is rapidly gaining its share of the overall marketing budgets (Ad Council 2015). Online display advertising was expected to reach \$63.2 billion globally in 2015 (Lunden 2014). The sophistication of online consumer targeting has evolved rapidly in the past several years. Online Ad Exchanges, that sell available advertising inventory in near real-time as the consumers load the web pages, now handle more than half of all available online display advertising inventory (BI Intelligence 2015). The Ad Exchanges bring together Publishers, operators of content web sites that make money by selling advertising, and Advertisers, entities interested in displaying ads to specific consumers. Potential ad impressions are offered on Ad Exchanges as the consumers visit specific web pages and Advertisers have about 100 milliseconds to place bids for the available inventory (BI Intelligence 2015). The second best bid auction format stimulates the bidders to reveal their reservation prices and the bid floor levels offer the same for the Publishers. Floor prices reflect the minimum bids that would be accepted by a Publisher on a specific advertisement

spot. The floor levels are typically known only to the exchanges and they are hidden from the Advertisers.

Both Publishers and Advertisers engage in optimization efforts. Publishers typically work with supply-side platform providers (SSPs) to increase the advertising revenue yield by tracking and modelling advertising demand, updating the floor prices and routing their inventory to specific exchanges. Advertisers commonly engage demand-side platform (DSP) providers to evaluate the potential interest of every consumer in a specific product or service and to optimize their bidding strategies to yield the desired prospects. Both SSPs and DSPs commonly rely on third-party data aggregators to enrich the data that they collect themselves. Figure 2 outlines the key relationships between market participants in online advertising.

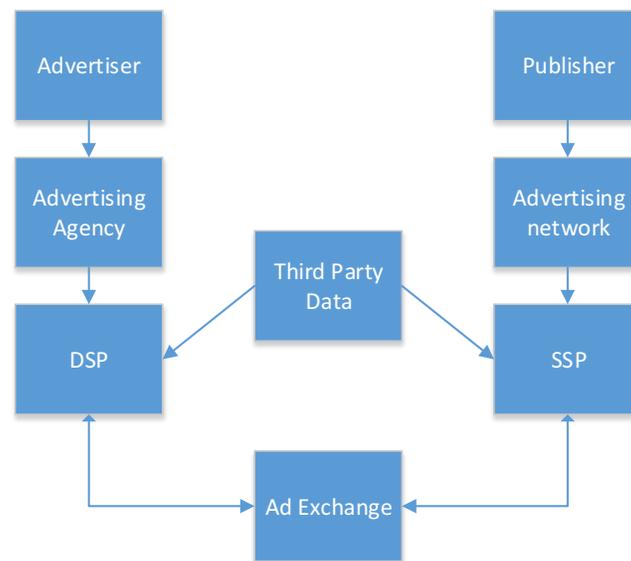


Figure 2. Online Advertising Market Participants

Consumer data plays a critical role in online advertising optimization. Behavioural tracking facilitated by placing cookies typically follows consumers across a panel of about 15,000 web sites that serve as proxies for consumer interests and current purchase considerations. For example, a visit to the ESPN web site would signal a general interest in sports, while a visit to cars.com would serve as a signal of possible consumer interest in purchasing a car. Estimates suggest that companies engaged in online consumer tracking collect information on roughly 190 million consumers in the United States and about 500 million consumers globally (Criteo 2015a). Collecting data on such scale generates petabytes of data on a weekly basis and requires sophisticated technical infrastructure to support data collection and analysis. To understand the role of different IT assets in providing the initial and the sustained competitive advantage in the online display advertising industry we will focus on Criteo, a leader in the online advertising optimization industry.

Criteo was founded in Paris, France in 2005 and the company went public in 2013 (Criteo 2015a). The company initially focused on developing recommendation engine solutions for e-retail clients and Publisher web sites, but it quickly emerged as a leader in online marketing. In its latest annual report for 2014, Criteo reported revenues of €745 million (approximately \$846 million) with 83.7% of the revenues coming from outside of France (Criteo 2015a). The company is unique in the online advertising space in that it offers solutions to both Publishers and Advertisers. It counts over 10,000 Publishers and 7,000 Advertisers as clients. Criteo effectively performs SSP and a DSP functions for their Publisher and Advertiser clients respectively. The company reports having

delivered over 1.7 trillion targeted ads in 2014 and generating over \$16.5 billion in sales from targeted ads for their Advertisers (Criteo 2015a). Criteo infrastructure includes several globally distributed data centers hosting over 11,000 servers with the combined storage capacity over 38 petabytes.

What is truly remarkable is that Criteo established this position with seemingly little in the way of technical innovation. The company reports that it has only a single patent issued in France, and only three patents issued in the United States, while six patent applications are pending (Criteo 2015a). The very limited technical intellectual property portfolio suggests that Criteo is primarily relying on commodity hardware and common algorithmic solutions to perform advertising optimization for their clients. Interviews with senior executives from several companies competing with Criteo confirmed this observation. Nearly all industry players rely on Hadoop clusters for data capture and logistic regression models for advertising optimization. Our interviews with the executives also revealed that the minimum technical infrastructure required to capture petabytes of data and to build predictive models is quite expensive, with the minimum required investment of \$50-60 million for the infrastructure. While the minimum required investment is a significant barrier for industry entry, there is little that differentiates the competing offerings in the market from one another in terms of the underlying technology.

In addition to the minimal differentiation in terms of technology, the time sensitivity of the underlying data further undermines the value of data resources possessed by the companies engaging in advertising optimization. The most recent consumer behaviour data offers the best clues to the specific consumer interests and the data beyond the most recent few weeks generally have little predictive value (Chen and Stallaert 2014). The rapid decay in the value of collected information means that there is very little opportunity for the individual companies engaged in advertising optimization to gain an advantage by collecting more historical data. Petabytes of historical data have little value beyond just a few weeks from the moment of collection.

Although the company executives are hesitant to publicly discuss company strategy, it is clear that Criteo management recognized these industry constraints early on and instead of developing intellectual property to protect its market position, the company instead invested heavily in developing partnerships with its Publisher clients. Criteo has built one of the largest advertising networks in the industry that includes over 10,000 Publishers. While the advertising network relies on commodity technology, its value stems from the access that it offers to advertisers. Larger advertisers prefer to work with advertising networks that can reach a wide audience. Since Criteo offers a one-stop solution for accessing and optimizing advertisements across a broad network, it has attracted a loyal patronage from top-tier advertisers. This creates a virtuous cycle of partner relationships supported through IT infrastructure. The company offers access to a large audience, which attracts advertisers. Criteo's ability to monetize the publisher web sites through advertising attracts new high quality publishers to join the advertising network. Criteo annual report states that the company revenue from established accounts grew 146% from 2013 to 2014 (Criteo 2015a). The most recent filings from the company suggest that this trend continues (Criteo 2015b).

Discussion

Case analysis

Applying the resource-based view of the firm perspective to the case studies, we find a significant variation in the type of data resources that are critical to the two industries. Loan performance datasets are relatively small, however they are very costly to obtain. A single record in the dataset requires the lender to risk \$35,000 in capital on average. Obtaining a two thousand record dataset requires putting \$70 million of capital at risk. The historical loan performance data is a critical data asset in the SMB financing industry and the past loan performance data retains value over a long period of time because it captures the fundamental relationships between business cash flows

and the loan default risk. The industry analysis reveals the presence of “naked” imitators, companies that effectively hijack the analytical capabilities of the early entrants that made the requisite investment in building the data assets and developed analytical expertise. The “naked” imitators effectively decouple the risk assessment process from the loan offers and exploit the analytical capabilities of the first movers for their advantage by offering to beat loan terms from the informed underwriters. This activity is leading to margin erosion in the industry and it is undermining the value of the historical loan performance data.

The data asset utilization profile in the online display advertising industry is quite different. The digital consumer data represent an essential asset for companies engaged in demand and supply side advertising optimization. The industry operates with big data of petabyte size. These data require a substantial investment in technical infrastructure for capture and analysis. The industry also faces a rapid depreciation of the data value because the most recent consumer behaviour is the best indicator of current consumer interests that can influence consumer response to advertising. Although the financial investment required to capture the data is significant (estimated at \$50-60 million), there are numerous data management platform providers that can supply the behavioural consumer data and therefore the data resources in the online display advertising industry are largely treated as a commodity with a very limited useful lifespan. Table 2 summarizes the key dimensions of data resources according the RBV perspective.

| | SMB financing industry | Online display advertising industry |
|--|---|--|
| Data resource | Past loan performance data. | Consumer behaviour data. |
| Size | Relatively small dataset, however the feature set is growing. | Big data, petabytes of data covering 500+ million consumers across 15,000+ web sites. |
| Appropriability | Past loan performance data is required for risk assessment of new business loan applications. | Recent online consumer behaviour data is essential for digital advertising optimization. |
| Assessment of rarity | The data resource is rare, requires a significant investment of capital and time to obtain. | The data resources are potentially available from multiple third parties. |
| Vulnerability to imitation, transfer and substitution. | The early entrant in the industry is facing “naked” imitation from competitors that do not possess the data resource. | The data resource is highly time sensitive, information loses value quickly. |

Table 2. RBV Dimensions of Data Resources in the SMB Financing and Online Display Advertising Industries

The following insights emerge from the cross-industry analysis of the data resource utilization. First, data resources can be valuable in spite of the size. While big data dominates the media, relatively small data resources can be extremely valuable. The SMB financing industry illustrates the value of relatively small datasets.

The second insight from the cross-industry analysis is that data resources can have a very limited useful lifespan. The data resources commonly used in the online display advertising industry require a significant investment in infrastructure to collect due to the size of data collected in real time, however the value of information retrieved from these data depreciates rapidly. The relative lack of differentiation among the data providers in online display advertising has contributed to

the perception of big data assets being a commodity in this industry diminishing the perceived value of these assets.

The third insight that emerges from the cross-industry analysis is that, in some cases, the companies that made the strategic investment in data resources, may face competition from “naked” imitators. The example of the SMB financing industry reveals that it is possible to imitate data resources by effectively decoupling analytical capabilities tied to data resources (business loan credit risk assessment) from business function (loan offer). Imitators in the SMB space make loan offers to prospective borrowers contingent on the successful procurement of a loan offer from the company possessing the required credit default risk evaluation expertise thus bypassing the need to collect the data required for credit risk assessment themselves.

The RBV perspective on the data resource utilization reveals that the data resources play a critical role in unlocking business opportunities. The SMB financing and online display advertising industry examples illustrate how data resources can facilitate not just entry into new markets, but the creation of new industries. However, the data resources in themselves do not afford a source of sustainable competitive advantage to the first movers that make the investment in the requisite data resources. The initial advantage gained by the first movers can face challenges from “naked” imitation and it can also be eroded by the time-sensitive nature of the data resources that rapidly depreciate over time.

The relational view emphasizes the importance of partnerships for creating and capturing business value. Applying the relational perspective to the SMB financing and online display advertising industries, we find that both industries reveal the importance of strategic partnerships in converting the first mover advantage into a sustainable leadership position. In the case of the SMB financing industry, unlocking the value created by OnDeck required not just developing a novel approach to SMB risk assessment, but also reaching the potential clients. OnDeck developed a strategic relationship with a key vendor in the SMB service space (Intuit) thus gaining access to the millions of small businesses that already use the Quickbooks accounting platform. OnDeck also developed an IT-enabled platform that offers partnerships to SMB consultants and advisors. In other words, OnDeck leveraged its unique capability in assessing SMB credit risk supported by its valuable loan performance dataset through partnerships with other companies that have existing SMB relationships.

Application of the relational view in the online display advertising industry also reveals the importance of partnerships in creating a sustainable competitive advantage. Although the data resources are essential for behavioural optimization in digital marketing, the resources are highly time sensitive and historical data offer little in the way of business value. Further, the digital advertising market attracted many entrants that began data collection, effectively turning the behavioural consumer data into a commodity. Recognizing this trend, Criteo, a leading company in the online display advertising industry, invested heavily into building partnerships with Publishers. This focus reflected the importance of the audience reach as the key factor in advertising budget allocation – the larger advertisers need global reach. It also reflects the complementarity of capabilities and resources between the traditional publishers and the technology companies in this industry. The Publishers specialize in content development that attracts an audience to online resources. The technology providers create value by optimizing monetization of the user traffic by personalizing the digital advertisements shown to each visitor.

Applying the four level framework proposed by Grover and Kohli (2012), we find that in both industries, the SMB financing and the online display advertising, there is little in the way of asset, knowledge or capability sharing. In both industries, the companies that made an investment in developing data assets have tightly integrated those assets within the core IT-enabled scalable services that they offer, however the data assets are not shared with any partners and neither is there sharing of knowledge nor capabilities. Further, the two case studies do not support the Relational View proposition (Dyer and Singh 1998) that trust provides an effective governance

structure in supporting value co-creation. Both OnDeck and Criteo rely on legal contracts to precisely structure their relationships with the key partners. Table 3 summarizes the observed asset, knowledge, and capability sharing arrangements as well as the governance structures within each industry.

| | SMB financing industry | Online display advertising industry |
|--------------|--|--|
| Key partners | SMB service providers, e.g. Intuit, business advisors. | Publishers, Advertisers. |
| Assets | Assets are not shared with partners. Assets are converted to services. Loan performance data powers the risk assessment within an integrated SMB loan service. | Assets are not shared with partners. Consumer behaviour data is embedded in SSP/DSP service. |
| Knowledge | Proprietary knowledge (SMB credit scoring expertise) is not shared with the partners. | Knowledge is not shared with the partners. |
| Capabilities | No joint capabilities development. IT-enabled systems enable partner revenue growth. | No joint capabilities development. IT-enabled systems enable partner revenue growth. |
| Governance | Standardized contractual relationships. | Standardized contractual relationships. |

Table 3. Value Co-creation Layers in the SMB Financing and Online Display Advertising Industries

In summary, we find that, consistent with the RBV perspective, data resources play an essential role in facilitating market entry and participation in the respective industries, however, valuable proprietary data resources do not offer a guaranteed source of sustainable competitive advantage. In the SMB industry, competitors lacking data resources are able to piggy-back on the analytical capabilities of the companies that built the resources. In the online display advertising industry, the large addressable market has attracted dozens of competitors offering advertising optimization services that have little in the way of differentiation in terms of the underlying technology. The aggressive competition as well as the time-sensitive nature of the data resources have effectively made the online consumer data and the optimization services commodities. In these circumstances, the strategic focus on developing the relationships with publishers afforded the early entrant in the industry an opportunity to build a unique advertising network with a broad reach valued by the advertisers.

Contributions

Our study contributes to both theory and practice. By contrasting the resource-based and the relational perspectives in the context of two different industries and two different types of data resources, we contribute to the integration of the divergent perspectives on the role of IT resources in business strategy. Our results suggest that the RBV and RV theories offer complementary perspectives on the potential synergies between valuable data resources and strategic partnerships, yet the emergent industry practices differ from the theoretically expected configurations suggested by either theory. While the RBV perspective advocates investment in rare resources that would be exclusively exploited by the firm, the RV theory suggests that the firms should instead invest in resources that would support partnerships. We find that firms do make investments in rare and appropriable data resources. They also engage in strategic

partnerships in order to increase the market value of their data assets. However the structure of the strategic partnership interfaces that we observe in both the SMB financing and online display advertising industries is different from the recommendations of the RV perspective.

The data resources are encapsulated within services that effectively preclude partner access to the underlying data assets, while enabling scalable exploitation of the data assets and analytical models built on their foundations. The service interface offered by OnDeck to its partners can assess the credit risk of a SMB loan applicant. The services offered by Criteo serve double duty capturing clickstream data and returning product and content recommendations to Criteo partners. Standardization of the partnership interfaces also allows for the standardization of the legal contracts detailing the structure of the strategic partnerships. The emergence of the legal contracts as the key governance structure in partnership relationships also differentiates the emergent structures from the propositions of the RV theory that suggests that less formal structures and trust are important governance mechanisms (Gallivan and Depledge 2003). Table 4 summarizes the predictions of the RBV and RV theories and contrasts them with the emergent industry structures.

| | |
|---|---|
| RBV recommendations: Firms should make investments in rare and appropriable resources and safeguard them from imitation and substitution. | RV recommendations: Firms should invest in partner-specific data resources and leverage the resources to create value through knowledge sharing and joint learning. |
| Emergent industry practices: Resources are embedded within services that are offered to partners Standardized legal contracts facilitate rapid expansion | |

Table 4. RBV and RV Recommendations vs. Emergent Industry Structures

Our key contribution to practice emerges from the analysis of the commonalities of strategies employed by both OnDeck and Criteo in the respective industries. While the two industries share little in common in terms of the structure or the core data resources, the emergent strategies employed by the early entrants that are successfully managing the transition to more mature industry structures are strikingly similar. In both cases, the companies have used the initial advantage gained through novel applications of data sources and information technology to develop standardized IT-enabled service offerings and immediately focused on the development of standardized, contractually governed partnerships that accelerated the adoption of the IT-enabled services by a large network of customers and partners. This approach affords the protection of valuable proprietary data resources, because they are encapsulated in IT systems and prevent any partner from misappropriating the data. At the same time, encapsulation of data resources and analytical capabilities in standardized IT-enabled service offerings maximized the efficiencies in marketing the services to potential clients.

Lastly, we would like to note that no research is without limitations. Our analysis employs the case study methodology that affords the study of complex phenomena in natural contexts, but it is nonetheless limited by the selection of the specific case studies. Consequently, the results may not generalize to other contexts. Further research would be required to evaluate the generalizability of the results presented here.

Conclusion

Drawing on the resource-based and relational view theories, we conducted a comparative case analysis of two emergent industries: SMB financing and online display advertising industries. Our analysis revealed that the emergent industry practices differ in important respects from the predictions of both theoretical perspectives. While the resource-based view of the firm emphasizes the exclusive exploitation of assets for the long-run success of a firm, the relational view posits the importance of inter-organizational collaboration and investment in jointly controlled assets to support inter-organizational learning. We find that firms do invest in the development of proprietary data resources and analytical capabilities, however the leading companies in the two industries that we analysed are critically depend on their partners for unlocking the business value of their data and analytical assets. To unlock the value of their assets, the firms develop standardized services accessible to their strategic partners and they rely on standardized legal contracts for rapid expansion in the emergent markets.

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