Adoption of Big Data Technology for Innovation in B2B Marketing

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# Abstract

## Purpose of the paper

The paper explores use of big data in innovation and market leadership in B2B relationships. It provides a framework to analyze the impact of big data, supported by four case studies.

## Methodology/approach

This is a conceptual paper, supported by case studies, offering the opportunity for concept generalization. The case study organizations are innovating to stay ahead in the market and to expand activity, using big data to exploit marketing opportunities and create new offerings.

## Findings

Organizations are recipients of and are collectors of big data, partly created by the increasing volume of business and customer transactions online. The qualitative exploration of the cases shows that big data and its analytics and applications can be taken as indicators of organizations’ ability to innovate to respond to market opportunities.

## Research limitations/implications

The online marketing environment is a dynamic one, where organizations must innovate to survive. A limitation is that the cases in the paper do not deal with those lagging in innovation, for whom survival is an issue. The paper’s examples are limited to successful organizations where big data, data mining and analytics led to strategic business success.

## Practical Implications

B2B organizations that operate in markets where their own products or services have a significant impact on how the products and services of their B2B customers provide value to end (B2C) customers should, in their innovation activity, engage fully with the end B2C market, together with their B2B customers. This has implications in every area from strategy to human resources. If the B2B organization’s pedigree includes B2C activity parallel to that of their customers but not competitive, this can give them an advantage in marketing, but if their B2C activities start to encroach on the B2C activities of their customers, this may cause conflict and loss of business. This implies that if marketing strategy becomes siloed between the different branches of the business, the potential for conflict increases.

## Originality/value of the paper

The paper’s value is in contributing to understanding big data’s role in business innovation, specifically in business to business organizations and where their innovation can transform customer experience at the end of the value chain i.e. with final consumers. Therefore, the paper helps to address a research gap in the literature, which tends to focus on how such innovation affects business to business relationships.

## Keywords

Big data, analytics, innovation, market leadership, businesses, customers, platforms, cloud computing

# Introduction

Big data refers to the increase in the volume of data that exceeds the capacity of traditional database technologies to store, process, and analyze (Hashem et al. 2015). The definition of big data keeps evolving, although there are four main characteristics (high volume, high-velocity, high-variety, and high-veracity) that commonly define big data (Lau et al. 2016). These characteristics and the organizational functions required to support better predictive and prescriptive analyzes are considered important in the literature (e.g., George, Haas, and Pentland 2014). Erevelles, Fukawa, and Swayne (2016) also identify the potential use of big data in capturing consumer behaviour and in formulating marketing strategy. The proliferation of mobile devices and social media platforms and their generation of high volumes of data and the development of information platforms for managing these volumes are providing challenges for businesses wishing to exploit big data (Huang 2011; Müller et al. 2016; Stone et al. 2017).

The aim of the paper is to provide a conceptual framework for analyzing the four characteristics of big data and decision-making, using insights from case studies. Without a constructive framework and appropriate analysis tools, researchers may be unable to gain full insight into the value of big data (George et al. 2016). Hopkins et al. (2011) report that the main challenge for organizations and researchers is to identify how development of big data and its analysis are transformed into applications and actions that benefit customers and companies. The case studies in this paper focus on this.

Big data provides opportunities for organizations not only to analyze high volumes of data at speed, but also to forecast what may benefit the organizations in the near future (Lee 2018). Forecasting outcomes of strategies is vital to advance organizations’ service to customers, and to stimulate organizational innovativeness (Antons and Breidbach 2018). This paper therefore explores cases where organizations have implemented big data analytics to enhance value, competitiveness, and innovativeness, developing a framework to guide understanding of big data characteristics in a B2B innovation context. Each big data characteristic has its own effect on improving marketing strategy and decisions. For instance, the high volume characteristic facilitates understanding of market acceptance of potential new products (Wamba et al. 2015). The proposed framework highlights the use of big data in supporting marketing innovativeness of business-to-business organizations.

# Literature review

In the information-hungry and information-intensive era (Huang and Rust 2013), the use of big data influences the performance of many types of organization, including B2B organizations. Whether for business process innovation (Wamba 2017) or product innovation (Zhan et al. 2017), big data is mined for information to generate critical insights and understanding of customer needs and identification of innovation opportunities (Troilo, De Luca, and Guenzi 2017; Chandy, Hassan, and Mukherji 2017).

Big data not only leads to commercial innovation but also generates information for social and economic purposes, for example, reducing crime-related risks in money transactions (Economides and Jeziorski 2017) or insurance fraud (Stone and Laughlin 2016). E-commerce and online activities in general have provided new sources of big data which offer opportunities for increasing competitiveness and effectiveness (Kauffman, Srivastava, and Vayghan 2012). The speed and accuracy with which people can be reached via the Internet and transact using it have increased the availability of data, revolutionizing the environment in which managers operate and how they manage their businesses, both in buying from suppliers and in supplying to customers (Lichtenthal and Eliaz 2003).

The concept of innovation has evolved from merely technological innovation (Frankwick 1996) to different forms of innovation, such as process innovation (Pisano 1997), service innovation (Gallouj and Weinstein 1997) and strategic innovation (Hamel 1998). In general terms, innovation can be defined as “any ideas, practice, or material outputs perceived to be new by the firm” (Zaltman, Duncan, and Holbek 1973, 13). The features and functionality supported by big data are also often associated with innovativeness. Gobble (2013) identifies that the journey from collecting big data to generating value out of it involves innovativeness. However, poor decisions on big data can cause organizations to suffer delays, misallocation of resources and bankruptcy (Judge and Miller 1991; Miller 2008), so it is important to understand the influence of big data on B2B innovation decision-making processes relating to both customers and business partners (Mueller, Mone, and Barker 2007). This includes the process of business model change (Stott, Stone, and Fae 2016).

The adoption of big data technology requires large investments (Terziovski 2010), while companies using it as the foundation of their business may take years to reach profitability, as in the case of Amazon or Google. Many companies cited for business to consumer (B2C) innovation have also radically transformed the B2B marketing world. For example, Amazon’s Marketplace has effectively created a B2B exchange for use by retailers of all kinds, while Google’s YouTube has transformed the video advertising world, as many advertisers now rely on the YouTube platform to increase forwarding and viewing of their advertisements, and for direct advertising, enhancing (since the Google take-over) Google’s main role as a B2B platform for carrying advertising.

# Developing a conceptual framework

The characteristics of big data are as follows:

* High Volume - much more data is collected, analyzed and used than previously
* High Velocity - data is collected and analyzed and results communicated much quicker than previously
* High Variety - big data is collected for various purposes and in all forms and sizes, some by businesses, some by not-for-profit organizations or government agencies, Coverage includes customers, markets, transactions and interactions, populations, resources, climate, facilities, infrastructure, and industry changes. The data is heterogeneous, some unstructured, some structured, numerical, in the form of text, audio, still and moving images
* High Veracity - the data must be known to be “true”, if an organization is to rely on the data for making decisions.

The attributes of big data are identified in Figure 1, which shows how the ‘decision-making process ‘feeds back’ (often in real-time) to its big data source to enhance the next cycle of decision-making using the 4V (volume, velocity, variety and veracity) characteristics of big data.’ Big Data Analytics’ refers to the process of transforming big data into actionable results to improve organizational performance (Wamba et al. 2017).

Figure 1 Transforming big data into value

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Manyika et al. (2011) suggest that big data analytics enables organizations to obtain value from high volumes of heterogeneous data by improving decision-making processes. Wamba et al. (2017) demonstrate the direct and indirect effects of the application of big data analytics in influencing the financial form and market performance of an organization. Several other studies (Davenport 2006; Davenport and Harris 2017) highlight the importance of big data analytics in achieving competitive advantage.

# Method and conceptual framework

As the aim of this paper is to provide a conceptual framework for analyzing the use of big data in innovation, an appropriate method is to use information on how organizations use big data and associated analytics to advance their offerings to businesses and consumers. To illustrate this, four exploratory case studies are presented. A case study is an empirical enquiry into issues existing in real life where the researcher has little or no control over events (Yin 2018). Qualitatively, a case study or a featured case study is appropriate in evaluating organizational activities, such as finding out clues and answers relating to “why” and “how”. The case studies were chosen from situations where the information management approaches had severely disrupted markets, whether in terms of new business models, new competition and/or radical improvements to benefits to customers. They are used to highlight the closeness of the relationship between success in achieving strategic objectives and innovating in information management. For example, The Transport for London case demonstrates how far data can be taken to improve customer service, benefitting both supplier and customers. It also shows the benefits when an organization creates and manages a data platform which it opens it up to end-users and intermediaries, using a partner’s high capacity data hosting, Amazon Web Services (AWS), to cater for processing loads that are subject to extreme fluctuations.

Marketing strategy teachers conventionally focus on separate market-focused elements of strategy (products, target markets etc.) rather than information management aspects. The case studies fill a gap in the literature by showing the value of an integrated approach. Leadership, innovation and competitiveness are closely related in B2B environments, so it is important to focus on the enablers of innovation, which include information management (Huang 2011).

# Case Study 1

The Greater London Authority (GLA) set up its open access platform, the London Datastore (https://data.london.gov.uk/) in 2010, for use, re-use and redistribution of the data. It supports operational service improvements, development of new customer-facing products and services, increased transparency and innovation, while allowing challenges existing ways of working by providing the data required to analyze alternatives (Stone and Aravopoulou 2018). It contains Transport for London (TfL) data and various other data sets, including planning and employment data. More than 80 TfL data sets are available, including real-time travel feeds, available to app developers via the TfL website and the GLA London Datastore. TfL engaged developers of apps and worked with them on designing the API (Application Programming Interface – allowing access to the data), allowed access to early versions, and worked in partnership to explore the possibilities that the data provided. This case study demonstrates how B2B and B2C innovation can go hand-in-hand in systems and data.

Transport for London is one of the most advanced of city transport authorities in using big data to facilitate travel (Barber 2018), so it was selected for case study research, to identify via interviews with senior managers and inspection of TfL reports and other secondary data how Transport for London had innovated in this way (Stone and Aravopoulou 2018). The case study showed that the innovative and advanced ticketing system (Oyster), associated with its collection of high volumes of data, use of cloud services to manage the data and provide access to citizens (Wentworth 2015), together with advanced bus and train tracking systems, combined with an imperative laid on senior management by the Mayor of London to put innovation at the heart of the organization, led to a situation in which big data produced significant gains for travellers (Deloitte 2017).

# Case Study 2

Netflix Inc. uses big data technology to understand customers’ viewing habits and to support a recommendation engine for customers (Chai and Shih 2017). This business to consumer relationship then drives its decisions about what content to acquire and increasingly, to develop itself as Netflix Originals. In an interview with Netflix’s engineering director and vice president of product innovation, Vanderbilt (2013) identifies how volume and velocity of big data algorithms in tracking customer viewing behaviour was fundamental to Netflix’s ability to read customer preferences and provide better service to their customers and feedback to content providers (Pääkkönen and Pakkala 2015). This confirms how B2B and B2C innovation are intertwined in the world of data and systems.

Netflix’s entry into the market was severely disruptive for other companies in the video-on-demand market, particularly cable and satellite TV companies. The choice of Netflix as a case study (and some of the data for it) were based on an in-depth interview with a senior marketing manager in one of the disrupted companies, who identified more specifically the nature of Netflix’s big data-based challenge (Parnell, Stone and Aravopoulou 2018).

Given the content of the other case studies in this article, it is interesting to note that Netflix also hosts some of its data on Amazon Web Services. It has moved away from its own Netflix data centres, and data is now hosted by Amazon Web Services and used to track users, their preferences and viewing (including whether they are part-way through watching) and their clicks, as well as the catalogue of content. However, since Amazon Prime’s entry into the video streaming business, this situation may not continue (Hoff 2017).

# Case Study 3

Amazon Web Services (AWS) leads the global cloud computing market, providing data storage and access facilities to many businesses, small and large (Mohan, Berggren, and DuBois 2017), so it was considered an important case study for this article. The research was conducted by open-ended interviews with senior staff in the London office, supplemented by secondary data. Cloud computing-provides on-demand computing resources over the internet, using a network of remote servers to store, manage and process large amounts of data faster and more reliably and securely than a local server. Flexible pricing has helped AWS to win customers on a pay-as-you-go basis, buying services on demand. The fact that Amazon hosts its own e-commerce application on AWS has helped AWS gain market acceptance. It is also low cost compared to its main competitors (e.g., Microsoft, IBM, and Google). Amazon’s entry market helped many of its B2B customers make or consolidate their use of cloud computing, providing secure, reliable and low storage and analytics. It has also made it easier for other companies to innovate using cloud services.

AWS counts amongst its clients the UK’s Driver and Vehicle Standards Agency, cited for its digital innovation (Illsley 2016) and TfL. Migration of TfL’s new website and service designs to the cloud was in response to changing customer needs (e.g. a rise in mobile and geo-location-based queries for journey planning) (Wentworth 2015). The migration made it easier for development teams to access real-time travel and transport data, increasing the immediacy and granularity of its services. TfL delivers a high volume of interactive services by using AWS services as a buffer between back-office services and customers.

Peak loads on the TfL website can occur due to bad weather or rail strikes, which may cause a 20-fold surge in site visitors (most in a single hour at the start of the working day). In the past, TfL over-provided capacity, but it can now auto-scale on AWS, scaling usage down later, to get more efficiency. Prior to TfL moving to a cloud-based infrastructure, there were few real-time feeds and it was hard for TfL to release travel data to many parties. TfL’s move to the cloud has unified all its transport data (compared to before, where it was all on different systems, in different formats, in different parts of TfL) and simplified developers’ access to data, facilitating access to real-time streams in consistent formats. Data is supplied by TfL’s own teams (those responsible for managing the services that collect or generate the data). They also become internal data consumers themselves (for TfL’s projects based on this data) alongside external developers. In some cases, vendors also become involved, where an API is needed to connect with back office systems (Stone and Aravopoulou 2018).

# Case Study 4

Central to Transport for London’s efforts to serve its travellers is its relationship with app developers, as was identified during interviews with Transport for London for the first case study in this article. The top apps amongst travel app users are shown below. Over 600 apps have been developed, reaching millions of active users, although most usage is from a surprisingly small number of apps – just over 40.

Top apps for accessing TfL data: Google Maps (56%); Apple Maps (42%); Bus Times London (25%); London Underground Map (25%); Citymapper (24%); London Underground (21%); Live London Bus Tracker (16%); Tube Map London Underground (16%); and London Bus Checker (15%).

Source: Transport for London

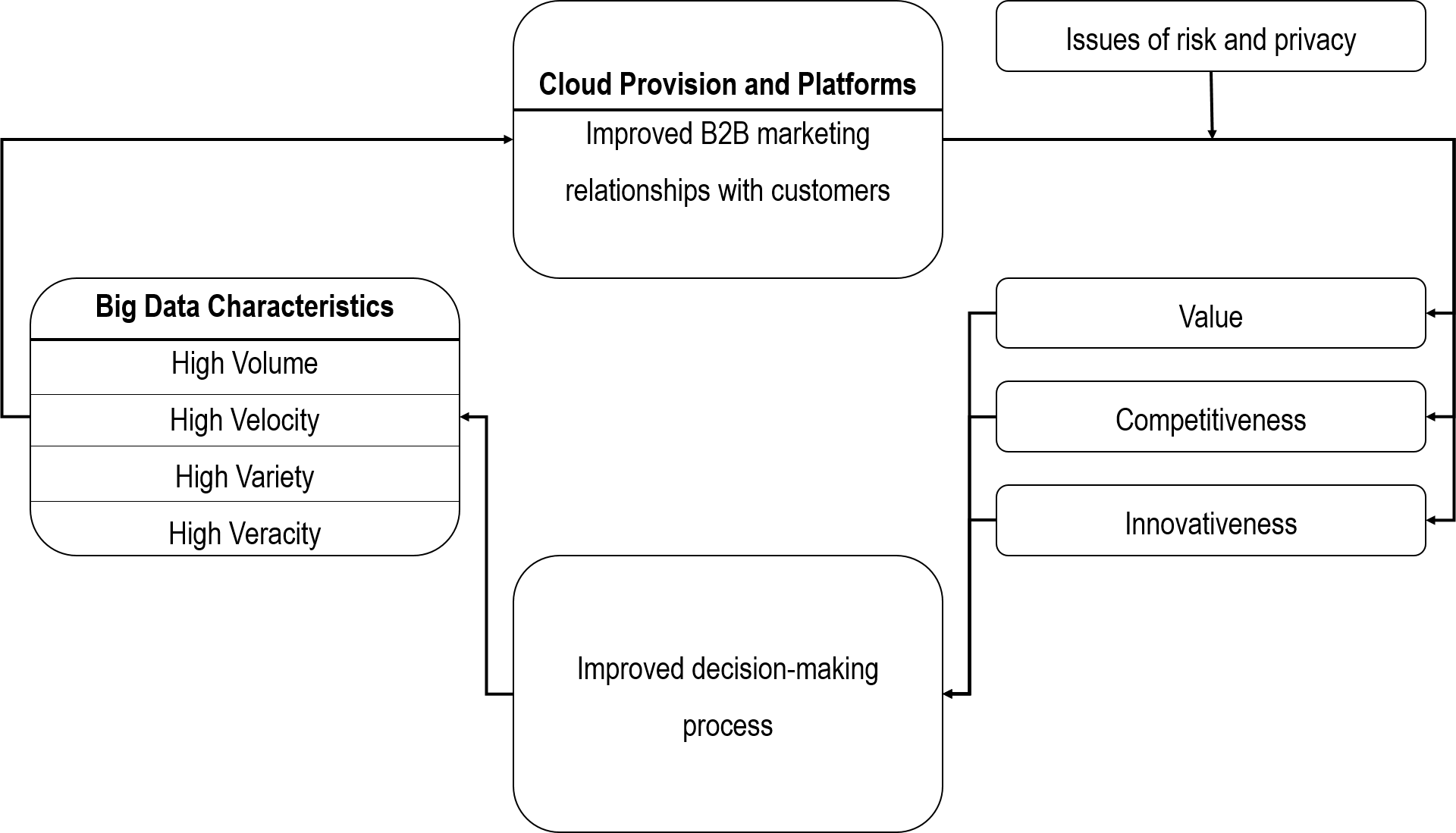
Once data is opened to developers, the relationship between data owners and other stakeholders, whether B2B customers or final consumers, changes. App developers facilitate relationships between the data or platform owner and customers, by adding new features (Qiu, Gopal and Hann 2017; Parker, Van Alstyne and Jiang 2016). However, app providers can become competitors. For example, Citymapper runs a limited bus service in London using customer request for TfL data gathered by its app (Kobie 2018). App providers can also take data from each other. Citymapper takes data from Uber to provide travel options. The result can be to shift share of value-added from data owner to app provider. This may not mean less value is added by the data owner, but it can be so, as in the case of Citymapper. Allowing third party app providers to access data and use it with customers means that the organization itself no longer needs to do all the innovation. It may have weaker control, but has the benefit that the ecosystem to some extent takes over (Adner 2006).

# Findings and discussion

This paper’s four case studies show how strategic understanding and deliberate use of big data characteristics can add value. A transport organization, TfL, improved access to data for all its customers and developed a much better understanding of patterns of use and customer preferences. A similar approach is shown in media - the Netflix case, but other examples include hospitality management (Xiang et al. 2015), customer relationship management (Phillips-Wren and Hoskisson 2015) and tourism management (Marine-Roig and Anton Clavé 2015).

The case studies contribute to refining of Figure 1, as shown in Figure 2 below where a cyclical process is demonstrated

Figure 2. Cyclical process of improving decision-making process of big data usage



# Cloud provision and platforms

The concepts of cloud computing, big data and platforms are intertwined. Theories and management practice are evolving rapidly in ways that are not in the scope of this article. Cloud computing supports massive-scale and complex computing and is transforming how big data is managed (Hashem et al. 2015). Cloud provision removes the need for costly computers and software, and this approach has facilitated growth in the use of big data. It removes capacity constraints on storage, allowing organizations such as Transport for London and Netflix to focus their innovation attention on providing better service. As already noted, opening data up to apps also has this benefit, so the combination of cloud provision and apps, by two new sets of business partners, can led to dramatically improved service to final customers. This is a theme that runs throughout all selected case studies.

To improve relationships with customers, organizations use cloud computing to facilitate application of big data technology in innovation (Loukis et al. 2017). The cost-effectiveness of cloud computing strengthens the productivity of big data technology, helping improve competitiveness (Gutierrez, Boukrami, and Lumsden 2015, Low, Chen, and Wu 2011). Loukis et al. (2017) also suggest that organizational innovativeness can be a by-product of cloud computing and big data technology adoption.

# Issues of risk and privacy

Big data sources include high volume data from public data, private data and community data (George, Haas, and Pentland 2014). The rise in data breaches (Sen and Borle 2015) and the global operations of B2B firms (Kraemer, Gibbs, and Dedrick 2005) suggest privacy issues from data breaches and the risk of being sued for compensation will become more important for B2B firms. Privacy also affects a firm’s competitiveness since information may be accessible by rivals (Kalvenes and Basu 2006). Firms may also suffer from customers’ unwillingness to disclose personal information due to lack of trust (Liu et al. 2005). Liao, Liu, and Chen (2011) show that negative prior experience of privacy risks leads to unwillingness to transact.

One of the reasons for cloud-hosting may be that a company believes that a cloud host can more reliably protect privacy than it can itself. A stronger and clearer privacy and governance approach (Wu et al. 2012) and appointment of a senior manager responsible for privacy (Fusaro 2000) may be needed to support the innovative use of big data, particularly (in the EU) in the light of the implementation of the General Data Protection Regulation.

# Value

Successful adoption of big data technology requires organizations to invest sufficient resources to ensure that value can be gained from the data in all aspects of management, from operational use to strategic planning. This may also involve changes to culture, people and technology (Davenport, Barth, and Bean 2012). Big data is regarded as one of the most prominent game-changers to marketing in this digital era (Chandy, Hassan, and Mukherji 2017). Similarly, Kiron, Prentice, and Ferguson (2014) emphasize how successful big data adoption requires a balance between organizational resources, such as employees’ analytics skills and technology capabilities and the overall organizational culture.

Big data characteristics, commonly identified as 4Vs, can also be described as 5Vs, with value being the fifth characteristic (Fosso Wamba et al. 2015, Jin et al. 2015, Marr 2015). Its value in contributing to innovation has been described in various ways, such as ‘the next big thing in innovation’ (Gobble 2013) or ‘the next frontier for innovation, competition, and productivity’ (Manyika et al. 2011). The implementation of big data analytics can increase marketing RoI by 15-20% (Court et al. 2015). Increased knowledge productivity arises from big data use, and may be critical support for economic growth (Jin et al. 2015).

# Competitiveness

The pressure to be competitive is a crucial determinant of the adoption of innovation and technology (Gatignon and Robertson 1989). Individual competitiveness is the “enjoyment of interpersonal competition and the desire to win and be better than others” (Brown, Cron, and Slocum 1998, 90). For B2B decision-makers, ‘trait competitiveness’ among management teams implies the drive to take actions to win against rivals. Karatepe et al. (2006) investigated the existence of trait competitiveness in an organizational setting, suggesting that the effort devoted to winning against competitors is positively related to competitiveness. Competitiveness has a positive influence on the performance of employees (Karatepe et al. 2006) and the organization overall (Schrock et al. 2016). This positive impact of competitiveness can be explained by the relationship between market competition and organizational commitment. Schrock et al. (2016) examined the role of competitiveness as an antecedent to organizational commitment and found direct and indirect relationships between these two elements. Organizational commitment enhances performance because commitment creates a winning spirit among a firm’s stakeholders, driving them to strive to do their jobs well (Schrock et al. 2016). Fletcher et al. (2008) suggest that the positive and optimistic attitude of individuals of competitive individuals boosts their abilities to perform, even when faced with obstacles. If adoption of the big data approach and the techniques and technology needed to deliver competitiveness becomes a central focus for analysis of competitive behaviour, studies of adoption of the big data approach in competitive environment must take into account the above-mentioned “human side” of competitiveness.

# Innovativeness

Organizational innovativeness is the desire to succeed and survive through the ability to produce ideas, innovate and be strategic in its decision-making (Ruvio et al. 2014). An example of the positive impact of innovating comes from the study by Rubera and Kirca (2012) that indicates the positive effect of organizational innovativeness on firm value, market and financial positions. The drive to embrace the use of big data is linked to its functionality in deriving information (e.g., Manyika et al. 2011) to support managerial decision-making processes and to communicate decisions to employees, suppliers and customers for implementation.

Research by Michaelidou, Siamagka, and Christodoulides (2011) and Siamagka et al. (2015) confirm that organizational innovativeness has a significant impact on the adoption rate of other information-based innovations, such as social media. The critical role of leaders in the adoption of innovation has also been noted (Caridi-Zahavi, Carmeli, and Arazy 2017; Chen et al. 2014).

# Resource requirements

Organizations need significant resources to collect, analyze and obtain value from big data (Johnson, Friend, and Lee 2017). Many studies of big data resources (Akter et al. 2016; Erevelles, Fukawa, and Swayne 2016; Wang and Hajli 2017) use the resource-based theory (RBT) to evaluate use of big data in organizations. RBT suggests that the rarity, value and imitability of resources determine the ability of the firm to gain competitive advantage (Barney, 1991). Our paper applies a case study approach to arrive at a refinement of a conceptual framework that can be applied to the study of big data in organizations. In the context of big data, the framework takes account of several types of resources needed by organizations. First, adoption requires the equipment to collect, store and analyze big data (unless cloud storage is used). This is especially important due to the high volume, variety and real-time usage of data (Davenport, Barth, and Bean 2012). Second, organizations need the expertise and skills to handle and extract value from big data (Erevelles, Fukawa, and Swayne 2016). Third, organizations need to innovate to exploit big data investments (Braganza et al. 2017) or engage with other businesses to do so. Fourth, organizations that lack resources such as particular IT expertise or appropriate systems might not benefit from big data adoption (Lamberg et al. 2009) unless they subcontract or work with other providers.

# Limitations

It is hard to measure the value of innovation adoption (Kohli and Devaraj 2003). Successful innovation adoption demands a balance between resources and costs required for adoption and benefits of implementing the innovation (Bunduchi, Weisshaar, and Smart 2011). The adoption decision requires thorough evaluation from financial, organizational resources and strategic viewpoints, as innovation adoption in information technology is usually risky (Meyer and Goes 1988). As Agarwal and Prasad (1998) show, innovations are intrinsically risky, especially without assurance that they will generate expected results.

Another limitation of this paper concerns the predominance of transportation case studies. Future research should incorporate cases from different sectors to gain wider insights into big data characteristics and decision-making processes.

# Implications for Business Marketing Practice

It is platitudinous to say that information technology is changing fast. When the first textbooks and articles on information technology marketing were produced in the 1980s, the most advanced B2B information technology products ranged from office productivity software to database software (Stone, 1984; Stone 1985). The idea that these systems would be used across companies, up and down supply chains and through entire ecosystems would have been regarded as revolutionary. Indeed, the application of the term “ecosystem” to information technology and application areas such as human resources, operations and marketing only occurred two decades or more later (Stone, 2014), while the idea of cloud storage and platform strategies are even newer, though based on ideas of shared resourcing that have existed for some time (Stone et al., 2017).

Today, a central question that product strategists in B2B information technology firms must address relates to which platforms are being used by target customers and how the data on those platforms is stored, accessed and analyzed, and how the data and analysis are shared cost-effectively throughout the ecosystem to deliver benefits to customers, whether other B2B players or final customers (the B2C dimension). Companies that address this question will gain a competitive advantage over companies that see their platform products just as another way of storing and sharing data.

This difference in B2B innovation philosophy is visible in the “clear water” opening up between Amazon Web Services and other companies in that part of the cloud storage market focused on customer information and its applications. The high market shares Amazon achieves in B2B markets such as financial services (banks and insurers), public services (particularly public transport, vehicle and driver licensing, taxation and benefits), and media is based partly on a strong focus on end-users. For example, in the UK in June 2018, Amazon Web Services ran a “Hackathon” together with Transport for London, the UK Ordinance Survey mapping authority and the UK Meteorological Office, where teams of developers (in which staff from the different sponsors were embedded) competed to develop apps for London travellers to facilitate their journeys. Part of the B2B philosophy of Amazon is to work with customers to solve the problems of customers’ customers i.e. the end consumer, an area where Amazon has considerable expertise.

This may sound like an advertisement for Amazon Web Services, but it reflects a philosophy recommended ever since the first books were written on B2B marketing. It is the thoroughness with which Amazon pursues this philosophy in its innovation and in its rapid changes of business model to support this direction that led to their lead over competitors, both in market share and pricing. It also means that Amazon Web Services tends to attract B2B customers who are keenest to partner fully with their supplier in finding ways to solve end customers’ problems and meet their needs.

# Implications for marketing education and academic research into marketing

The “poor relative” status of business to business marketing, in university education and research, has been a constant focus on attention by those marketing academics who understand business to business marketing (Lichtenthal, 2007; Spekman, 2015). The implication of the findings of this article are that teaching of and research into business to business marketing and business to consumer marketing should be more integrated than currently. In some, though not all markets, the two are so closely intertwined that it does not make sense to separate them.

# Conclusions

The paper addresses the links between big data, organizational innovativeness and marketing for B2B, taking account of how changes in the B2B section of the value chain can transform the B2C end. It contributes to development of a conceptual framework using case studies, which highlight the role of big data. This paper fills a gap in the literature concerning the importance of B2B relationships in innovating for final customers through big data and in changing B2B relationships between end-customer product and service providers and various systems supplier higher in the value chain. It identifies the importance of innovativeness in creating new B2B relationships, to transform the end-value delivered.

The implications for B2B innovators are clear. If your product or service can (or perhaps should) change how your customers serve their customers, then it is important to engage very fully with their efforts to serve their customers, including full participation (and support for the development of) the ecosystem which supports your customers in service of their customers. You cannot stand back and hope that your B2B customers will solve their problems without your help, because if you do, then you will open the door to your competitors.

In this article’s case studies, the main services provided by the B2B innovator are data storage, access and analytics, but could be anything from industrial equipment maintenance to purchasing management. The lesson is the same. In many markets, B2B and B2C innovation are closely intertwined, and in these markets, B2B suppliers ignore this at their peril.

This has many implications, not just for marketing, sales and customer service staff, but also for those who hire them, train them and manage their retention and progression (e.g. human resources, senior line management). It requires the B2B team to have a sufficient “leavening” of people with a strong B2C orientation but who are at home in B2B. In the world of information technology, such people are at a premium.

So, if the B2B company has a pedigree including B2C activity which is parallel to that of their B2B customers but not competitive, this can create a marketing advantage. However, if their B2C activities start to encroach on the B2C activities of their customers, this may cause conflict and loss of business, w,g the move of Amazon into the film and video content market, in the Netflix case study. This implies that if marketing strategy becomes siloed between different branches of the business, the potential for conflict increases.

More generally, big data use can be critical in improving decision-making (Davenport 2013, Delen and Demirkan 2013). The conceptual framework and case studies show that transforming big data into value depends on organizations’ understanding of big data and its characteristics and of how value is delivered through its use. The discussion highlights actions needed to minimise privacy risks. Overall, this article opens a new avenue for research, to examine decision-making process in B2B marketing innovation and how big data and associated analytics supports it and can generate new strategies.

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