Special Collection: Big Data Adoption for Knowledge-based Business Models

INTERNATIONAL JOURNAL OF ENGINEERING BUSINESS MANAGEMENT

International Journal of Engineering Business Management
Volume 10: 1–8

DOI: 10.1177/1847979018767776
journals.sagepub.com/home/enb
SAGE

Big data management: The case of Mulino Bianco's engagement platform for value co-creation

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Abstract

In the past few years, an explosion of interest in big data has occurred from both academia and business communities. To reduce the uncertainty associated with some types of big data, organizations can adopt specific strategies inspired by service-dominant logic and value co-creation between organizations and customers. Specifically, alternating the extant body of literature and the results emerged from the case–study analysis of Mulino Bianco's 'Nel mulino che vorrei', this research illustrates how different organizations can purposefully design particular engagement platforms for 'joint agential experiential creation' of big data and how organizations design digital and interactive environment in order to acquire and manage integrated, cleaned, trustworthy and efficiently accessible data for decision-making or product innovation activities. From a theoretical viewpoint, this basis model for joint agential experiential creation of big data advances the extant research offering a useful insight to reduce data veracity. From a practical perspective, this study explains why organizations should invest in engagement platforms, such as digital forum, social media brand pages or specific digital and interactive environment built for the occasion, to facilitate the collection, storage and the analysis of customer-generated big data.

Keywords

Big data, data analytics, big data analysis, sentiment analysis, fuzzy logic, Mulino Bianco, value co-creation, engagement platform

Date received: 28 December 2017; accepted: 3 March 2018

Introduction

The explosion of interest for big data among scholars and business communities[1] is due to the fact that big data holds a vast potential for boosting innovation, competition and productivity in a wide range of fields, from the e-commerce industry to the public organizations.[1–3] Described as 'the mother lode of disruptive change in a networked business environment',[4] big data is also perceived as a source to improve decision-making processes,[5] new product development[6,7] and customer relationships.[1,8,9] Although there's so much optimism on the big data, the debate about how organizations translate, as well as fail to translate, the potentials of such amount of data into actual social and economic value suggests the need for critical reflections.[10] For example, the unstructured data generated by customers using Web and digital technologies, commonly is exacerbated by the loss of context. As underlined by Clarke, 'The absence of this information greatly increases the likelihood of misinterpretation',[11] and, consequently, can jeopardize

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the applicability and the validity of such data, for example, in making decisions.

In this regard, the work seeks to offer its contribution in terms of implications for both academicians and practitioners, showing why and how organizations should adopt strategies inspired by service-dominant (S-D) logic and value co-creation by means of a full involvement of their customer who, in this perspective, becomes a co-creator. Therefore, integrating the extant body of literature and the results emerged from the case–study analysis of 'Nel mulino che vorrei', this research illustrates how different organizations should create engaging solution for joint experimental creation[12] of big data.

This article is organized as follows. Initially, we describe the theoretical background of this research. Then, we present the case study and explicate the emergence of engagement platforms provided by organizations to collect the customer-generated big data for specific goals such as open innovation, product optimization, decision-making processes and co-creation of advertising ideas. Finally, we consider the research implications and outline some limitations and ideas for future research.

Theoretical background

Big data

As a relatively new phenomenon, much of the literature on big data concentrates on what is big data,[2] how it occurs and under what conditions it can create value and innovation in business.[13]

Despite the great attention given to this issue, big data is a difficult term to define.[14–16] Initially, the attention was focused on the high-volume data. Manyika et al. defined big data as 'the amount of data just beyond technology's capability to store, manage and process efficiently'.[16]

In agreement with the definition advanced by the Gartner Group, big data 'is high-volume, -velocity and -variety information assets that demand cost-effective, innovative forms of information processing for enhanced insight and decision making'.

With regard to high-volume data, we intend that the size of data is larger than terabytes and petabytes.[17] This means that big data data sets, as underlined by Franks,[14] are 'beyond the ability of typical database software tools to capture, store, manage and analyze'.

High velocity refers not only to the speed of data creation and accumulation, it also deals with the data processing. In order to improve its value, big data must be analysed, processed and visualized quickly.[17,18]

High variety refers to the wide range of big data types. Generally big data comes from emails, search queries, social networking interactions, online payments, audiovisual materials and so on.[17] When stored in some repositories, data can be distinguished in the following categories: structured, semi-structured or unstructured. Structured data have an organized structure and are clearly recognized. Semi-structured data do not conform to fixed fields but contains tags to separate data elements (i.e. data in many bibliographical software programs reflect semi-structured data). Unstructured data do not contain a recognizable structure, such as text messages, social media data, audio/video material or location information.[2,17]

In addition to the 3Vs of volume, velocity and variety, White[19] suggests that the V of veracity is the reliability of data sources. In order to generate authenticated and relevant data, big data verification is unavoidable. The existence of bad data, in fact, might obstruct organizations in making a correct analysis of a specific situation or business objective.

Big data and value co-creation

The present marketing competition has become data competition. This means, as underlined by White,[19] that organizations 'are now appreciating for the first time just how important effective information management is to their future success'.

As shown previously, big data is generated by multiple sources and has different forms. Constantinides and Lorenzo-Romero[20] underlines that to obtain such data, organizations can opt for two different ways: the passive way and the active way. Adopting the passive way, organizations limit themselves to collect big data using social media monitoring and listening tools. Embracing the active way means, on the other hand, engaging customers by attracting them into specific platforms engineered to enable the big data co-creation.

By adopting an S-D logic lens,[21–23] consumers are involved in the co-production of product/services. Specifically, they are both *operand resources* and *operant resources*, that is, resources capable of creating value for all the actors of the system.[24]

Following this logic, organizations and consumers co-create value integrating two heterogeneous kind of resources. Consumers generate data in the form of information (especially unstructured data such as text messages); organizations, instead, provide specific engagement platforms to acquire such data. For example, if a brand creates an engagement platform to launch a new product and consumers participate actively proposing their point of view and information, both the brand and the engaged consumers will benefit at the end of the process of open innovation. Specifically, the brand will obtain low-cost precise information to make right business decisions, and consumers will receive a product/service that suits their needs and expectations.

Big data and engagement platforms

In the marketing literature, engagement represents a multidimensional concept focused on consumers' cognitive, emotional and behavioural dynamics in an interactional

marketing environment.[25,26] Therefore, if we assume that the person/consumer as the focal 'engagement subject', it follows that the specific 'engagement object' may vary across contexts. For example, consumers engage with brands, products or services, other consumers, brand communities and, how in our case, platforms created by organizations that enhance the big data production and storage.

Through the lens of S-D logic, customer engagement is considered a micro-foundation for value co-creation. As underlined by Storbacka et al.,[27] 'without actor engagement, no resource integration happens and no value can be co-created'.

Generally, organizations for encouraging value co-creation with customers create specific engagement platforms.

The concept of an engagement platform has been introduced in the marketing literature by Prahalad and Ramaswamy.[28] In detail, an engagement platform can be defined as a purpose-built, information and communication technology-enabled environment that contains artefacts, interfaces, processes and people, whose design intensifies interaction and value co-creation between organizations and their customers.[12]

Engagement platforms play as an intermediary, they are specific agential assemblages,[12] that is, they are aggregators of actors, such as consumers and members of an organization. Consequently, their main role is to facilitate the engagement among the different actors and to put them and their respective resources together.[27]

Research methodology

Case–study design and case selection

In order to achieve our research purpose, we adopted a theory-driven exploratory case–study approach. We have chosen this method for the following reasons. First, this research attains to explore how a specific organization, namely Barilla S.p.A., creates an engagement platform strategy to facilitate data co-creation. Second, co-creation, 'joint agential experiential creation' and engagement platform are strongly metaphorical construct. Thus, an exploratory method allows us to better understand the linkage between a theoretical plane and a contextual phenomenon. Third, this issue is still in its infancy. Therefore, in order to identify a new theoretical model, a case–study method is preferred.

The case: Mulino Bianco's 'Nel mulino che vorrei'

In Italy, very few organizations have adopted a big data co-creation strategy to achieve their business objectives. One of these rare cases is Barilla S.p.A. Founded in 1877 by Pietro Barilla originally as a bread and pasta shop in Parma, today, this firm has multinational operations in the market of pasta, ready-made sauces, bakery and bread products, which works through 30 production poles, including pasta factories, furnaces and mills. Barilla Group controls 14 brands. One of the most successful brands owned by Barilla is Mulino Bianco. Founded in 1975, this brand offers a specific food category that includes bakery products, snacks and biscuits. To improve or innovate its products, Mulino Bianco started 'Nel mulino che vorrei'. Launched on 8 March 2009, this project represents a concrete example of an engagement platform designed for 'joint agential experiential creation' of big data.

Basically, this project represents an open innovation strategy, that is, consumers are involved in peer-to-peer dialogue with the company[29] in order to express their opinions about product development, vote the most interesting ideas of other consumers and comment on the selected proposals. In particular, the initiative is based on three key assumptions summarized in the slogan, 'The project does not speak, it listens; The project does not say, it does; The project does not teach, it learns'.

Concretely, the process of collecting and analysing consumers' ideas and proposals happens inside a specific and innovation platform, that is, a virtual space where people can sign in and interact with the tasks assigned by the managers or supervisors of 'Nel mulino che vorrei' community.

Since its launch, the initiative has been very successful (see Table 1). In fact, after only 9 months, the platform had already gathered around 1800 ideas, 19,000 votes and 15,000 comments. In 2010, the first results of the value added process began to emerge, as demonstrated by the production of a product ('the Soldino') previously withdrawn from the market by the company.[30] Over time, the initiative continued to gain consensus, to the point that 5 years after the launch, the platform counted 7438 ideas, 335,886 votes and 25,326 comments.[31] At the end of 2014, 21 ideas had turned into new products and 10 were still being evaluated. To date, data published by consumers and managed by the company show a somewhat astonishing growth of the users' interest and involvement: 10,773 ideas, 5,427,.407 and 1,169,490 comments.

Data processing method

The method of collecting, analysing and putting into practice consumer's ideas is composed of five steps (see Figure 1).

- **Step 1:** *Personal data registration*. In order to interact with 'Nel mulino che vorrei' platform, consumers must first register to sign in. After the registration, consumers receive their identification credentials. Specifically, he or she gets a nickname and a personal password that will allow him or her to create a virtual profile and navigate easily to every section of the website.
- **Step 2:** *Data input, ideas, comment, votes.* Once registered, consumers can post their own ideas,

Table 1. 'Nel mulino che vorrei' life cycle and growth rate.

Time period	Ideas	Votes	Comments
December 2009	1800	19,000	15,000
April 2014	7438 (+413% compared to December 2009)	335,886 (+1768% compared to December 2009)	25,326 (+169% compared to December 2009)
November 2017	10,773 (+595% compared to December 2009 and +145% compared to April 2014)	5,427,407 (+28,563% compared to December 2009 and +1615% compared to April 2014)	1,169,490 (+7797% compared to December 2009 and +4618% compared to April 2014)

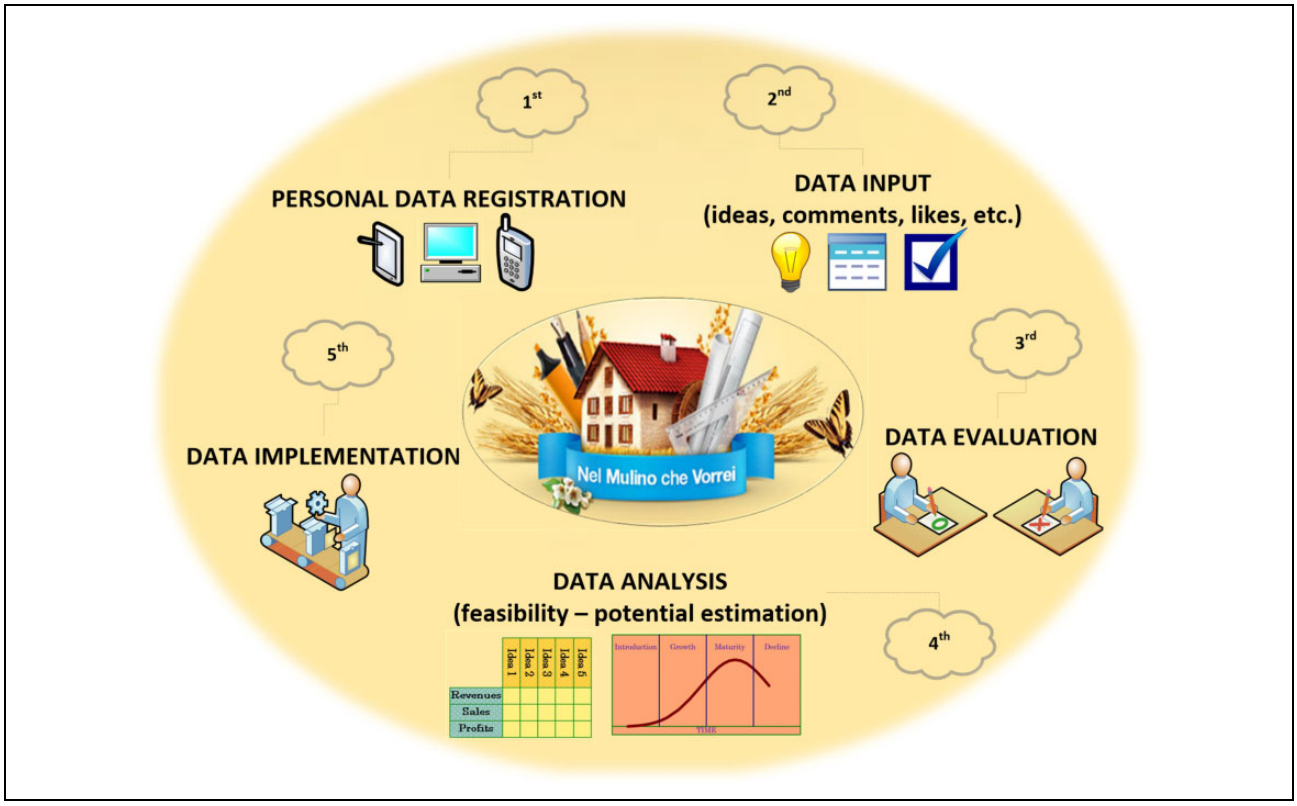

Figure 1. 'Nel mulino che vorrei': Data processing method.

express an opinion, post a comment, provide a suggestion and/or vote against approval of other consumers' proposal. All contributions are supervised; hence, the offensive or denigrating contributions will be rejected.

- **Step 3:** *Data evaluation.* The most 10 voted ideas are subjected to an evaluation process along with the other proposals that, regardless of the votes received by other users, are considered meritorious by the company. To simplify the procedure, the platform has been implemented with a self-assessment system that evaluate the originality of consumers' proposals. In addition to human intervention, there is also a suggestion mechanism, based on an algorithm, capable of signalling to consumers that their ideas have already been proposed by someone else. Whenever an idea previously selected or voted by consumers is discarded, it is deleted from the 'top 10' and replaced by the successive one.[31] This evaluation phase lasts approximately 6 weeks.
- **Step 4:** *Data analysis-feasibility and potential estimation.* In order to verify both its technical and economic feasibility, the most interesting ideas proposed by consumers are submitted to a second level of evaluation. In this stage, several variables are taken into account by Mulino Bianco managers, such as the cost–benefit ratio, the production need, the possible sales volume, the potential profit margin and so on. The duration of this phase is quite variable. Typically, it takes about a year to be completed.
- **Step 5:** *Data implementation*. In this phase, data are used for the effective product realization. Usually,

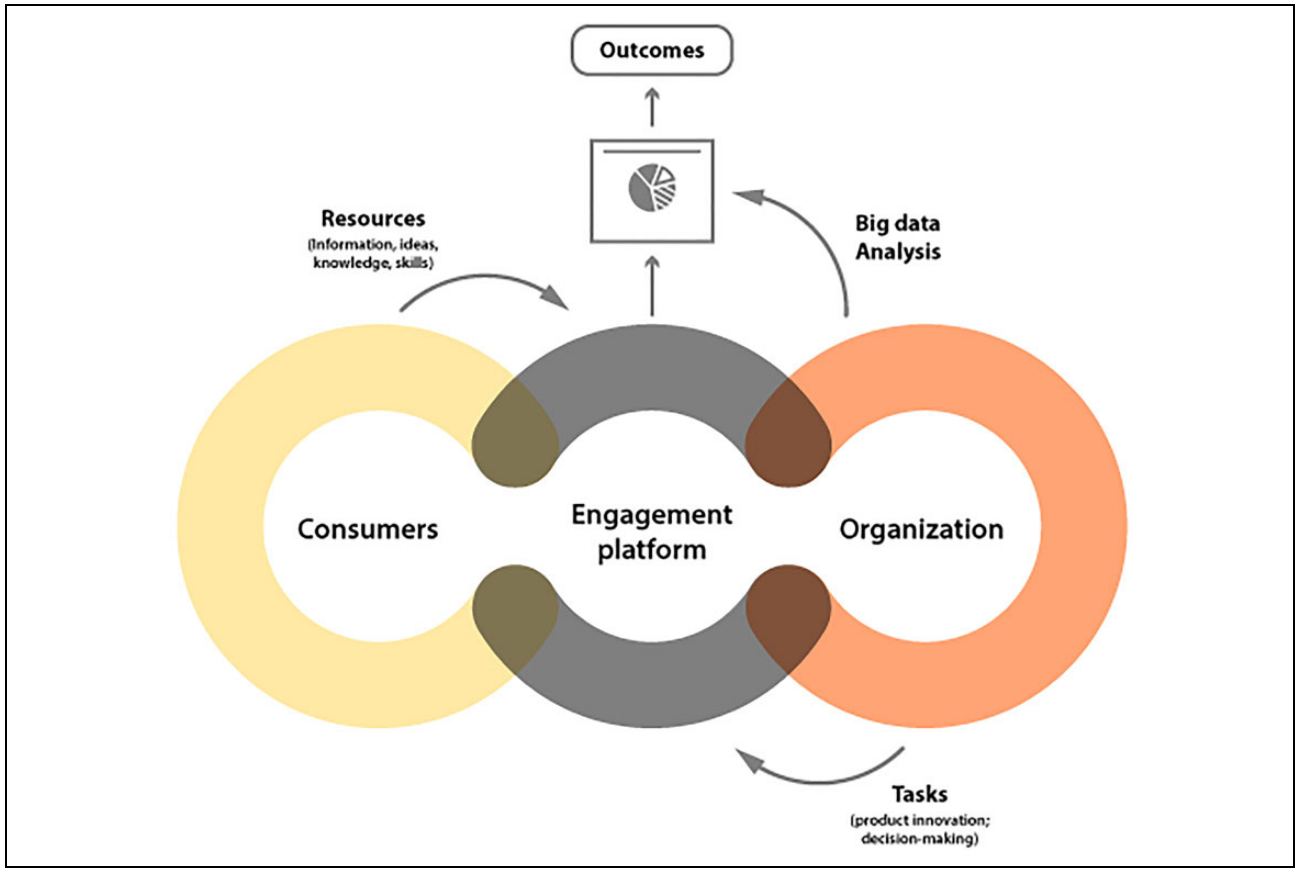

Figure 2. Joint agential experiential creation of big data model.

the introduction of a new product requires time. The production of a new kind of biscuit, for instance, might need 24 months of work.[32] Using its platform, Mulino Bianco will always stay in touch with the consumers and will provide them feedbacks about product realization process.

'Nel mulino che vorrei': engagement properties

This case study shows that organizations can leverage specific digital and interactive platform to collect and analyse a massive amount of data produced by consumers in a spontaneous way. The number of actors engaging with the platform will increase if the actors receive some kind of benefits. Such benefits, as we find in Storbacka et al.[27], can be relational, informational or motivational benefits.

Relational benefits are satisfied when consumers are able to interact with other actors using the same engagement platform. Informational benefits focus on information exchange in order to solve a wide range of problems that matter to consumers and organizations. Motivational benefits occur when consumers receive something in return that satisfies their recreational needs, such as gamification or self-gratification needs (i.e. consumers are satisfied when their idea is voted by other people or concretely realized by the firm).

Discussion

In this section, the main theoretical contribution of this article and the main practical implications are summarized. We also highlight the research limits and recommendations for future studies.

A theoretical model: joint agential experiential creation of big data

This article contributes to the literature on big data presenting a basis theoretical model (see Figure 2) for data collection grounded on the logic of 'joint agential experiential creation' enacted through engagement platforms.

The concept of joint experimental creation introduced by Ramaswamy and Ozcan,[12] instead of concentrating on the actors of the system, empathize an agency view of value creation. The attention is drawn on the capacity of the different individuals, immersed into a dynamic and interactive environment, 'to engage with other in collectively organized action contexts, temporal as well as spatial'.[33] This relational view of agency, as explained in previous studies,[12,34] is expressed in interactional assemblages.

Organizations design a specific engagement platform depending on the nature of the task. In this research, we have focused on organizations' infrastructure for big data

acquisition. Specifically, we have seen how organizations design digital environments, where consumers spontaneously produce knowledge and information.

These technological elements for big data acquisition, data warehousing and data analysis, such as 'Nel mulino che vorrei', are not simply implicit premises but the essential components of value co-creation. In order to extract social or economic value from big data, both organizations and consumers apply their specialized competences in the service exchange. In particular, an organization provides a specific digital platform, and customers generate spontaneous information.[24] Ultimately, the benefits created by this cooperation are bilateral. This collaborative experience offers functional, emotional and self-expressive benefits to consumers,[12] and organizations, instead, obtain useful and low-cost data to improve specific business processes.

Theoretical insights

We believe that this basis model for joint agential experiential creation of big data advances the extant research offering a useful insight to reduce data veracity.

As emerged from the literature, big data mining encounters many challenges. As supported by Paris, Donnal and Leeb,[35] the main challenges of big data analysis derive from a lack of data provenance, knowledge and discrepancies of scale inherent in data collection and processing. Our research findings reveal that, in order to reduce the 'noise' presented in the data sets and acquire integrated, cleaned, trustworthy and efficiently accessible data, organizations can leverage a joint agential experiential creation model.

Compared to other sources, such as social media user-generated content, engagement platforms furnish more precise, unambiguous and contextualized data. The data creation, in fact, as emerged from the case–study analysis of 'Nel mulino che vorrei', is guided and stimulated by a specific human–actor (i.e. tutor or platform/community manager).

Managerial implications

From a practical perspective, this study explains why organizations should invest in engagement platforms, such as digital forum, social media brand pages or specific digital and interactive environment built for the occasion, to facilitate the acquisition, accumulation and final interpretation of customer-generated big data.

First, investing in such strategies enable organizations to moderate big data taking under control volume, velocity, variety and veracity. Second, investing in infrastructures such as engagement platforms allow organizations to make sense of the data easier. For instance, 'Nel Mulino che vorrei' shows how Mulino Bianco's managers extract semantics from a huge amount of unstructured data with no difficulty. Finally, the joint agential experiential creation of big data is a cost- and time-effective method for moderating and curating data. It has no overhead costs and produces high-quality results with little investment.

Limitations and future research

This research inevitably presents some limitations. It takes into account only a single case study, ignoring other realities of the national or international landscape. One potential future research is to expand the number of cases, focusing, for example, on other organizations that operate in the same or in different sectors, in order to make comparisons capable of highlighting similarities and differences and give robustness to the basic model of joint agential experiential creation of big data proposed in this article.

Conclusion

Although big data is recognized as 'the new oil' of the digital era,[36–38] in some circumstances, its potential lack of objectivity and altered results are not excluded. Based on evidence from an exploratory case study, and taking into account the S-D logic and the concept of joint agential experiential creation, this research proposes a basis model to reduce the uncertainty associated with certain types of big data analysis.

Reviewing the literature, we have seen how organizations can choose two different ways of obtaining big data: the passive way and the active way. Adopting the passive way, organizations limit themselves to extract and collect large amount of big data from the Web. The risk in this case is to deal with loss of context, ambiguity and uncertainty. Adopting the active way, organizations create specific digital platforms to engage consumers. In this case, big data is the result of a value creation activity. Two different actors, in fact, integrate heterogeneous resources: organizations provide engagement platforms for big data acquisition and consumers generate information.

If in the mainstream big data management (i.e. extract large amount of data from the Web), consumers are considered a passive asset, the basic model of agential experiential creation of big data proposed in this article, which demonstrates that consumers play an important role together with the organizations both in the process of collecting valuable, authentic and manageable information and in the process of transforming such data in social and economic value.

The potentials of using big data to make decision in business, as underlined by Uthayasankar et al.,[39] are endless but restricted by the availability of technologies, software and human skills for big data analytics. The introduction of a model based on big data co-creation between the organizations and the consumers may represent an interesting tool to extract meaning from the data. In order to develop better tools to manage big data and create advantage in market, future studies are welcome.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

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