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Article

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MANAGEMENT | REVIEW ARTICLE

Big Data viewed through the lens of management fashion theory

Dag Øivind Madsen^{1*} and Tonny Stenheim²

Abstract: Big Data (BD) is currently one of the most talked about management ideas in the business community. Many call it the “buzzword of the day.” In books and media articles, BD has been referred to as a “revolution” and “new era.” There is lots of optimistic and upbeat rhetoric surrounding BD. This has led some to question whether BD is a hyped-up management fashion. In this paper, the BD phenomenon is viewed through the lens of management fashion theory. Management fashion provides an analytical lens which can be used to analyze the supply and demand side forces shaping the emergence and evolution of BD. The analysis shows that BD emerged in the late 1990s, gained momentum during the mid-2000s and legitimacy in the late 2000s, and enjoyed an almost meteoric rise in popularity in 2011 and 2012. Moreover, the analysis shows that BD currently is a very popular and highly contagious management idea exhibiting several hallmarks of a management fashion. At the same time, evidence suggests that it may be of a longer duration and not just another transient management fashion or fad. The findings have several implications for the study of the BD phenomenon and more generally, management and IT fashions.

Subjects: Critical Management Studies; Management History; Organizational Studies

Keywords: Big Data; management fashion; IT fashion; hype cycle; supply side; demand side; rhetoric

1. Introduction

1.1. Big Data

Big Data (BD) is currently one of the most talked about management ideas in the business community and something of a buzzword (Bruns, 2013; Lewis & Westlund, 2015; Waller & Fawcett, 2013).

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The authors have published related papers on other management concepts such as the Balanced Scorecard.

PUBLIC INTEREST STATEMENT

Big Data is currently one of the most talked about management ideas in the business community. Many call it the “buzzword of the day” and the discourse about Big Data is heavily dominated by optimistic and upbeat rhetoric. This begs the question of whether Big Data will turn out to be the “perfect wave” that organizations have been waiting for, or if it will be another short-lived management fad. This paper examines the Big Data phenomenon from a management fashion perspective. Although Big Data exhibits the characteristics of a management fashion, the evidence presented in this paper suggests it could be of a longer duration.

Commentators have noted that there is much “hype and hullabaloo” (Boellstorff, 2013) and a “craze” (Harford, 2014, p. 17) surrounding BD. BD currently ranks 11th in Bain & Company’s management tools and trends survey (Rigby & Bilodeau, 2015). Moreover, BD is a hot topic on the conference circuit, a topic for executive education courses, and widely referenced on social media platforms such as Twitter and LinkedIn. In 2015, President Obama delivered a short keynote address at a BD conference (YouTube, 2015), which indicates that BD currently is a topic of national and international significance.

In books and media articles, BD has been referred to as a “revolution” and “new era” (Brown, Chui, & Manyika, 2011; Manyika et al., 2011; McAfee & Brynjolfsson, 2012). The BD market is huge, spearheaded by actors such as IBM, HP, and Oracle (Gandomi & Haider, 2015; Matthias & Gregory, 2015). The abundance of optimistic and upbeat rhetoric surrounding BD has led some to ask the question whether BD is a fad and hyped-up by actors (e.g. consultants, software vendors, and conference organizers) with vested interests in the commercial success of BD. As pointed out by Bruns (2013, p. 1), there are “significant commercial interests which now attach themselves to the generation, marketing, and utilisation of “big data”.

However, at the same time, BD is also starting to attract widespread attention in academic circles. Although academics tend to be less enthusiastic about the future of BD than practitioners (Bukh, Klausen, Minbeava, & Mols, 2015), BD is nevertheless currently a hot and timely research topic (Chen, Mao, & Liu, 2014). Many academics in different research fields are repackaging their research to fit within a BD context (Bruns, 2013). Just in the last few years, we have seen the emergence of academic journals specializing in BD (e.g. Big Data Research and Journal of Big Data). This signals that BD could be more than a fleeting fad or fashion.

1.2. Purpose and contribution

Although there are some academic and journalistic articles discussing aspects related to the emergence and evolution of BD (Diebold, 2012a, 2012b; Gandomi & Haider, 2015; Lohr, 2012, 2013; Matthias & Gregory, 2015) as well as analyze it as a cultural and social phenomenon (e.g. Boyd & Crawford, 2011, 2012), BD has not, to the best of our knowledge, been viewed from a management fashion perspective.

In our view, management fashion theory (e.g. Abrahamson, 1996; Carson, Lanier, Carson, & Guidry, 2000; Kieser, 1997) could shed light on aspects of BD which could explain its rapid diffusion and popularization in both the business community and in academic circles. Taking a fashion perspective on BD is natural given that it is currently one of the biggest buzzwords (Bruns, 2013; Lewis & Westlund, 2015; Waller & Fawcett, 2013) and much “hype and hullabaloo” (Boellstorff, 2013) around it. Moreover, a spectrum of different actors has commercial interests tied to its continued success (Bruns, 2013).

1.3. Structure

Section 2 briefly outlines the management fashion perspective which will be used as an analytical lens to study the historical emergence and evolution of BD. Section 3 analyzes the supply side forces shaping the evolution of BD, while Section 4 takes a demand side view. Section 5 discusses the findings in light of central themes in the management fashion literature. Section 6 concludes and discusses limitations and directions for future research on the BD phenomenon from a fashion perspective.

2. A management fashion perspective on Big Data

2.1. The management fashion perspective

This section very briefly outlines the management fashion perspective. Much of the focus of management fashion theory has been on understanding the spread of management concepts and ideas such as Balanced Scorecard (e.g. Ax & Bjørnenak, 2005), Quality Management (e.g. Thawesaengskulthai &

Tannock, 2008), or Lean (e.g. Benders & van Bijsterveld, 2000). According to Jung and Kieser (2012, p. 329), management fashions are “management concepts that relatively speedily gain large shares in the public management discourse.”

In recent years, researchers in the IT and information systems fields have applied management fashion theory to understand the evolution of IT innovations and fashions. Studies have shown that the IT field is not prone to fashion and hype cycles (Baskerville & Myers, 2009; Slongo, Blanck, Brinkhues, & Mello Oliveira, 2015; Wang, 2010). Several IT-related innovations and fashions have been shown to be partly driven by social and institutional factors. For example, the emergence and popularization of Cloud computing (Su, 2011) and social media (Bergquist, Ljungberg, Zaffar, & Stenmark, 2013) may be at least partly driven by management fashion-setting processes.

Central in the management fashion-setting process is the role played by the “fashion-setting community” (Abrahamson, 1996) or “management fashion arena” (Jung & Kieser, 2012; Kieser, 1997; Klineciewicz, 2006). This field of actors comprises consulting firms, software vendors, management gurus, conference/seminar organizers, business school academics, business media, analysts, as well as professional organizations (for an overview, see e.g. Madsen & Slåtten, 2013). These supply side actors do not solely communicate and disseminate fashionable concepts and ideas via traditional brick and mortar outlets and channels; increasingly, this is also happening via the Internet. For example, in recent years, we have seen the rise of social media as a channel where management fashions are diffused and disseminated (Madsen & Slåtten, 2015a).

2.2. Emergence

First, we analyze the emergence of BD as a management idea. BD is a relatively nascent phenomenon, but pinpointing the exact origins of BD is not easy since there is little in the way of history on the topic. Some researchers and journalists have written on the origins of the term, and in some papers, it is pointed out that BD can be traced back all the way to late 1990s (Diebold, 2012a, 2012b; Lohr, 2013). Matthias and Gregory (2015) point out the role played by IEEE conferences and academics involved in the field of system engineering.

However, BD as a term did not gain mainstream appeal and momentum until mid-2000s when technology firms started promoting BD as a solution. Several recent articles on BD have pointed out that the term BD was popularized by technology firms peddling ERP, CRM, and other business analytics solutions (Gandomi & Haider, 2015; Matthias & Gregory, 2015). Lohr (2012, cited in Boellstorff (2013)) points out that BD gained widespread legitimacy sometime around 2008. Boellstorff (2013) comments on the rise of BD by noting that it, in less than a decade, has secured a “dominant position” in many different sectors of society.

2.3. Popularization

BD has risen tremendously in popularity in recent years. Today BD is “big business” and one of the most talked about management ideas in both print and social media outlets. There are currently a great number of BD-related events, conferences, training courses, educational programs, to name just a few. However, BD is not all “talk”; it also seems to resonate with managers in organizations around the globe. Evidence of this is the fact that BD made the top 25 in Bain & Company’s biannual survey of management tools and trends in 2013, debuting in 17th place (Rigby & Bilodeau, 2013, p. 2). As pointed out by Rigby and Bilodeau (2013, p. 9), “Big Data Analytics was below average in usage but above average in satisfaction. Based on our experience with tracking tool use, when satisfaction is high but usage is low, usage tends to grow.” Two years later BD has risen to 11th place (Rigby & Bilodeau, 2015). Hence, this survey suggests that BD is on an upward trajectory in terms of its use in practice.

There is, however, some disagreement over whether BD will continue to increase in popularity or whether it has peaked. Gartner’s hype cycle report for 2015 suggests that the hype may be over (Gartner, 2015). Similarly, an opinion leader such as stats guru Nate Silver has stated that BD has

peaked (Needle, 2015). On the other hand, there is also evidence pointing in a different direction. For example, interest in academia is increasing (Chen et al., 2014) and a number of specialized BD journals have popped up over the course of the last few years, which suggests that BD could have some staying power and stick around for a while.

2.4. Buzzword and mobilizing metaphor

2.4.1. BD as a buzzword

A number of commentators have noted that BD is “the buzzword of the day” (Waller & Fawcett, 2013, p. 77), “buzzword du jour” (Lewis & Westlund, 2015), or “the latest buzzword in the scholarly as well as commercial research community” (Bruns, 2013). Harford (2014, p. 14) points out that “as with so many buzzwords, ‘big data’ is a vague term, often thrown around by people with something to sell.”

Buzzwords such as BD may have different functions in organizations (Cluley, 2013): (1) to claim authority, (2) to facilitate action, and (3) to displace responsibility. To the first point, managers may utilize the term BD to claim authority. Talking about BD calls to mind images of innovation, control, and profits. Using terms such as BD can make managers sound innovative and technologically literate and as Abrahamson (1996, p. 267) calls it “at the forefront of managerial progress.”

Second, BD could be used to facilitate action and drive organizational changes. It becomes easier to argue that changes are necessary because BD is changing the business environment (see Table 1). Third, managers could use BD to displace responsibility. For example, managers can use the rhetoric surrounding BD to argue that it is not really *their* decision (Cluley, 2013, p. 40). Cluley (2013, p. 40) notes that buzzwords such as BD “help managers to shift responsibility for their decisions on to privileged others with expert powers such as management consultants.” In the case of BD, these privileged others could be technology experts and consultants.

As Table 1 shows, positively charged phrases and rhetoric are used quite extensively in key BD books and articles published over the last few years. In general, the BD discourse is dominated by enthusiastic and upbeat rhetoric. BD is described in big terms as a revolution, a new era, and a paradigm-shifting innovation.

2.4.2. BD as a mobilizing metaphor

BD may also function as a so-called “mobilizing metaphor” which in the field of anthropology is defined as a buzzword which attracts mass popular support (Shore & Wright, 1997). Mobilizing metaphors are typically socially appropriate. In the business world, notions of having access to BD and analytic tools have a high degree of social appropriateness and legitimacy. For example, in a globalized and turbulent business environment (see e.g. Kaarbøe, Gooderham, & Nørreklit, 2013), it is difficult to argue against the potential benefits of having access to tools which help in analyzing data about customers, employees, etc.

Table 1. Examples of rhetoric surrounding BD

Description	Reference
“Management revolution”	McAfee and Brynjolfsson (2012)
“Innovation story of our time”	Brynjolfsson and McAfee (2011)
“Era of Big Data”	Brown et al. (2011)
“Revolution”	Mayer-Schönberger and Cukier (2013)
“Future Revolution”	Syed, Gillela, and Venugopal (2013)
“The Next Frontier”	Manyika et al. (2011)
“Different”	Davenport, Barth, and Bean (2013)

The use of mobilizing metaphors can have several useful functions in organizations. For example, mobilizing metaphors could be used to mobilize support among organizational members and create unity. Metaphors can also downplay disagreements and ideological differences. For example, BD can create a shared understanding that certain organizational changes are necessary to increase productivity and profits.

The label BD can also be seen as what Briers and Chua (2001, p. 242) refer to as a visionary object:

These are conceptual objects that have high levels of legitimacy within a particular community. They can evoke similar emotive and affective responses from a wide spectrum of people; possessing a sacred quality that makes it difficult for a “rational” person to be against them.

As was shown in Table 1, the very upbeat rhetoric touting the importance of BD makes it difficult for managers to be against BD since it currently has such a high degree of legitimacy in the business community.

3. The supply side of Big Data

In this section, we examine the supply side of BD and analyze the spectrum of actors involved in the BD fashion-arena.

3.1. The BD fashion-arena

The analysis shows that there is a diverse constellation of supply side actors promoting and backing BD such as IT firms, consulting firms, gurus, and conference organizers (Table 2). The activities of these respective actors will be described and analyzed in greater detail in the subsequent subsections.

3.2. IT and business analytics firms

Software firms often play important roles in relation to the diffusion of management concepts (Klincewicz, 2006). In relation to BD, software firms have played a particularly important role. As the quotes in Table 3 show, the market for BD has been spearheaded by corporate technology giants such as IBM, SAS, Oracle, and the like (Gandomi & Haider, 2015; Matthias & Gregory, 2015).

Several of the large IT and Business Analytics firms such as IBM, SAS, Oracle, and HP offer BD-related products and services (see Table 4). IBM is a particularly influential player in the BD market. IBM offers a wide variety of BD products and services, e.g. magazines, a website, resources for developers as well as journals. IBM has been identified as one of the most important “Big Data Influencers.” Oracle is another active player in the BD market. For example, Oracle has published a comprehensive Big Data Handbook (Plunkett et al., 2013). In addition, Oracle offers training and certifications. HP offers solutions and software related to BD, as well as organizes a large HP Big Data Conference.

3.3. Consulting firms

The management fashion literature points out that consulting firms play important roles in the diffusion of management concepts and ideas (Heusinkveld, 2013; Heusinkveld & Benders, 2012; Jung & Kieser, 2012). Most of the leading consulting firms such as McKinsey & Company, Bain & Company, Boston Consulting Group, and Booz Allen Hamilton offer BD consulting services. In addition, Accenture, EY, and PWC all offer consulting services related to BD (Table 5). Harford (2014, p. 15) points out that “consultants urge the data-naïve to wise up to the potential of big data.”

McKinsey & Company has written extensively about BD, and can be considered an early mover in the BD market. McKinsey’s publication *McKinsey Quarterly* has published several articles on the “era of” BD (Brown et al., 2011) and the potential of BD (Bughin, Livingston, & Marwaha, 2011). As noted

Table 2. Examples of actors involved in the BD fashion-arena

Actors	Examples
IT/Business analytics firms	<ul style="list-style-type: none"> • IBM • SAS Institute • SAP • Oracle • HP • Microsoft
Management consulting firms	<ul style="list-style-type: none"> • McKinsey & Company • Boston Consulting Group • Bain & Company • Accenture • PWC • EY
Academia	<ul style="list-style-type: none"> • Business Schools (e.g. MIT Sloan, Kellogg) • Academics (e.g. Brynjolfsson) • Academic journals focusing on BD
Management gurus	<ul style="list-style-type: none"> • Big Data “Influencers” • Data science “Leaders” • Big Data “Heroes”
Conference/seminar organizers	<ul style="list-style-type: none"> • Big Data Conferences
Business media	<ul style="list-style-type: none"> • Print-based and web-based Magazines (Forbes/ Forbes.com, TechCrunch.com etc.) • Book publishers
Social media	<ul style="list-style-type: none"> • Twitter • LinkedIn • Blogs

Table 3. Quotes about the role of technology firms

Illustrative quote	Reference
<i>Technology companies, be they ERP systems or CRM software providers, and Business Analytics have been promoting Big Data for over a decade</i>	Matthias and Gregory (2015, p. 2)
<i>The popular discourse on big data, which is dominated and influenced by the marketing efforts of large software and hardware developers, focuses on predictive analytics and structured data</i>	Gandomi and Haider (2015, p. 137)
<i>The current hype can be attributed to the promotional initiatives by IBM and other leading technology companies who invested in building the niche analytics market</i>	Gandomi and Haider (2015, p. 138)

by Harford (2014), McKinsey Global Institute has highlighted how BD could lead to potentially huge costs savings in sectors such as health care.

Boston Consulting Group has published a wide range of articles on BD in their magazine BCG Perspectives. Similarly, Bain & Company has published a number of Bain Briefs related to BD, e.g. on the value of BD (Wegener & Sinha, 2013) and on the organizational challenges associated with its implementation (Pearson & Wegener, 2013). In addition, Bain has published infographics and other

Table 4. Examples of IT companies' activities in relation to BD

IT company	Examples
IBM	IBM Data Magazine
	IBM Big Data Hub (www.ibmbigdatahub.com)
	IBM Developer Works
	IBM Journals
Oracle	Big Data Handbook
	Big Data Analytics Training
	Big Data Certifications
HP	Big Data Solutions
	Big Data Software
	HP Big Data Conference

Table 5. Big Data practices at leading management consulting firms

Consulting firm	Practice	Web link
McKinsey	Big Data & Advanced Analytics	http://www.mckinsey.com/insights/big_data_and_advanced_analytics
Boston Consulting Group	Big Data & Advanced Analytics	https://www.bcgperspectives.com/big_data_and_beyond
Bain	Advanced Analytics/Big Data Consulting	http://www.bain.com/consulting-services/advanced-analytics/index.aspx
Booz Allen Hamilton	Big Data	http://www.boozallen.com/consulting/view-our-work/48383297/turning-big-data-into-big-insights
Accenture	Big Data Research	https://www.accenture.com/us-en/insight-big-data-research.aspx
PWC	Data and Analytics Framework	http://www.pwc.com/us/en/analytics/big-data.html
EY	Big Data	http://www.ey.com/GL/en/Issues/Managing-finance/CFOnedtoknow-AM-Big-data

web-based resources.¹ Booz Allen has also positioned themselves as suppliers of BD services, having published, for instance, an article on BD in relation to “The Cloud” (Jacobsohn & Sullivan, 2012).

Accenture has also developed a strong profile in relation to BD. For example, Accenture has set up a practice called “Big Data Research” and published reports such as “Big Success With Big Data” (Accenture, 2014). Accenture has also entered into an alliance with MIT Sloan in the field of business analytics (aba.mit.edu). This alliance communicates its findings and results via social media, e.g. on Twitter using the account @MITBAAlliance and the hashtag #AccentureMIT.

3.4. Academia

Academia, in particular business schools, usually play important roles in legitimizing and institutionalizing new management concepts and ideas (Hedmo, Sahlin-Andersson, & Wedlin, 2005; Sahlin-Andersson & Engwall, 2002). In this section, we will examine the take-up of BD in higher education institutions, executive education, as well as in academic research publications.

3.4.1. Take-up in higher education institutions

BD has been taken up by elite institutions such as Stanford and Harvard (Table 6). This signals that BD has a strong standing even within the most prestigious academic institutions in the world. Moreover, a wide range of regional institutions offer degree programs or concentrations in BD

analytics. BD also has international appeal. For example, The Norwegian University of Science and Technology has named BD as one of its “strategic research areas.”

3.4.2. Executive education

The high newsworthiness of BD and all the attention that it currently receives in the business community means there is high demand for executive education programs focusing on BD. Several leading business schools in the US (e.g. MIT, Northwestern, and UNC) offer shorter programs focusing on BD (Table 7). For example, MIT Sloan offers programs featuring data experts Sandy Pentland and Erik Brynjolfsson, the latter being a prolific voice on BD (e.g. Brynjolfsson & McAfee, 2011; McAfee & Brynjolfsson, 2012).

3.4.3. Academic journals

A number of academic journals focusing on BD have popped up in recent years (Table 8). Many researchers across different academic fields have started to frame their research as “BD research” (Bruns, 2013). In the words of Bruns (2013), “the hype surrounding the term has led a substantial number of researchers to rebadge what they do as “big data research” without necessarily engaging with the concept in any significant scholarly way.”

These new journals focusing on publishing BD research could help in institutionalizing BD. This has been seen in the context of other fashionable concepts such as Total Quality Management (TQM). Journals focusing on TQM (e.g. The TQM Journal, Total Quality Management & Business Excellence) are still actively publishing TQM-related research some 20 to 30 years after the peak of the quality movement.

Table 6. Examples of BD initiatives at higher education institutions

Institution	BD initiative	Web link
Stanford	BD in biomedicine	http://bigdata.stanford.edu/
Harvard	BD courses	http://www.extension.harvard.edu/academics/courses/big-data-analytics/24038
Norwegian University of Science and Technology	“Strategic research area”	https://www.ntnu.edu/ime/bigdata
Florida Polytechnic	BSc degree in BD analytics	https://floridapolytechnic.org/academics/advanced-technology/big-data-analytics/
Becker University	Concentration in BD analytics	http://www.becker.edu/academics/departments-programs/business/big-data-analytics

Table 7. Examples of business schools’ activities in relation to BD

Business school	Activity	Web link
Northwestern—Kellogg	Leading with Big Data and Analytics—From Insight to Action	http://www.kellogg.northwestern.edu/execed/programs/bigdata.aspx?utm_medium=Search&utm_source=bing&utm_campaign=Exec_Ed_Programs&utm_device=c&utm_matchtype=e&utm_term=big%20data%20conferences
Northwestern—Kellogg	Podcast: Making Data Work Harder for You	http://insight.kellogg.northwestern.edu/article/making-data-work-harder-for-you
MIT Sloan	Big Data: Making Complex Things Simpler	http://executive.mit.edu/openenrollment/program/big-data-making-complex-things-simpler
UNC Kenan-Flagler	Big Data and Business Analytics	http://www.kenan-flagler.unc.edu/executive-development/open-enrollment/programs/big-data

Table 8. Examples of journals focusing on Big Data

Journal name	Publisher	Web link
Big Data Research	Elsevier	http://www.journals.elsevier.com/big-data-research/
Journal of Big Data	SpringerOpen	http://www.journalofbigdata.com/
Big Data	Liebert	http://www.liebertpub.com/big
International Journal of Big Data Intelligence	Inderscience	http://www.inderscience.com/jhome.php?jcode=ijbdi
Big Data and Society	SAGE	http://bigdatasoc.blogspot.com/p/big-data-and-society.html

3.4.4. Print media discourse around BD

Figures 1 and 2 show the growth in articles on BD over time, as reported by ScienceDirect and ProQuest, respectively. The two figures show a similar pattern. The discourse about BD started to take off around 2011–2012, and since then, there has been an exponential growth in the number of published articles.

3.5. Management gurus

Management gurus are usually quite heavily involved in the diffusion and popularization of fashions (Huczynski, 1993; Jackson, 2001). In this section, we will examine different important opinion leaders and influencers in the BD market. The previous sections have demonstrated that there are diverse groups of actors involved in the BD markets, and many are trying to position themselves as thought leaders or “gurus” on BD.

Many magazines and BD-related publications have created lists of the top thinkers in relation to BD. For example, in 2012, Forbes Magazine listed the top BD influencers (Shaughnessy, 2012). Table 9 shows that these include Bob Gourley, Publisher of CTOvision.com, Kristen Nicole, who blogs about BD (www.siliconangle.com), as well as Pete Skomorch, Principal Data Scientist at LinkedIn, and writer at TechCrunch. Some also argue that IBM can be considered an influencer (Bigdata-madesimple.com, 2014). As shown in Section 3.2, IBM plays a very active role in the BD arena, promoting many products and services. IBM also lists Big Data Analytics Heroes² on their website, which can be considered a type of BD “hall of fame.” Similar initiatives have been seen in the context of other management concepts, e.g. “The Balanced Scorecard Hall of Fame” (Cooper, Ezzamel, & Qu, 2012; Foster, 2006).

Figure 1. Hits for Big Data.

Source: ScienceDirect, accessed October 23, 2015.

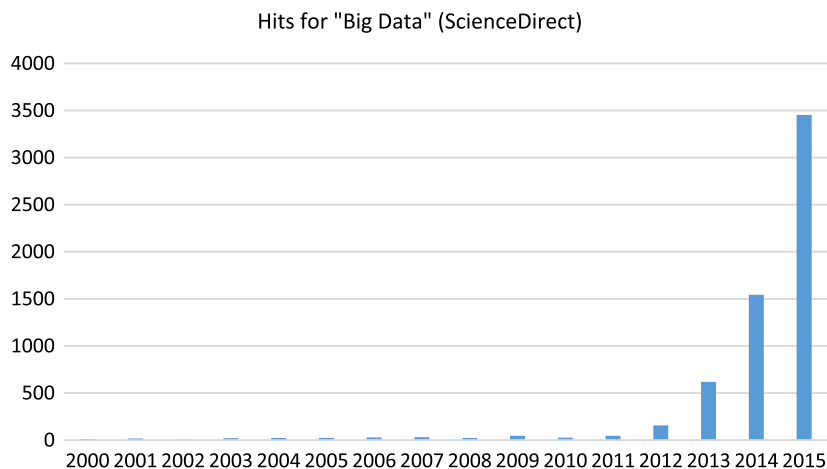


Figure 2. Hits for Big Data.

Source: ProQuest, accessed October 23, 2015.

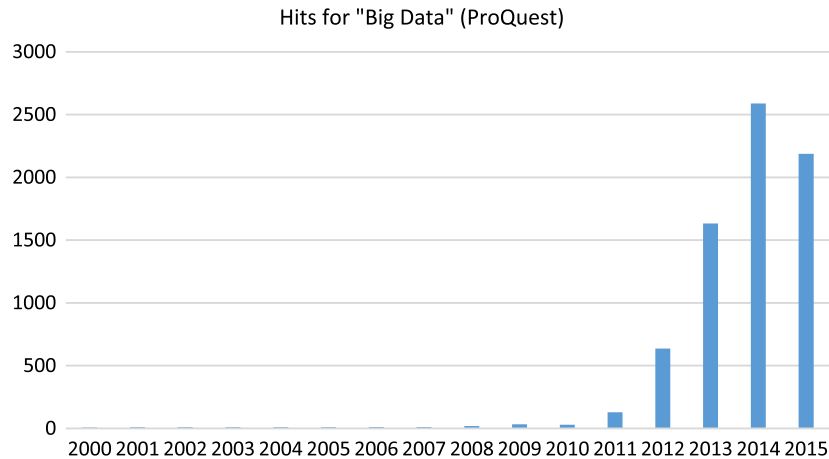


Table 9. Examples of BD Influencers

Influencer	Affiliation	Web link
Bob Gourley	Publisher of CTOvision.com	http://www.crucialpointllc.com/company/bob-gourley-bio/
Pete Skomorch	Principal Research Scientist, LinkedIn	https://www.linkedin.com/in/peterskomoroch
Kristen Nicole	Senior Editor, SiliconANGLE.com	http://siliconangle.com/blog/author/kristennicole/ www.kristennicole.com

Others have made lists of “data science leaders” (Table 10). In one recent article, some data science leaders provide predictions about the future of BD (Van Cauwenberge, 2015).

3.6. Book publishers and management books

Popular management books are an important medium for the dissemination and diffusion of management ideas (Clark & Greatbatch, 2004; Furusten, 1999). Just in the last few years, a large number of books about BD have been published (Table 11). Many of these have become bestsellers. For example, Mayer-Schönberger and Cukier (2013) is currently 11th on Amazon’s bestseller list in the management science category.³

Table 10. Examples of data science leaders (Source: Van Cauwenberge, 2015)

Data science leader	Affiliation	Web link
Bernard Marr	Academic and author of bestselling books	http://www.ap-institute.com/chief-executive.aspx
		https://www.linkedin.com/in/bernardmarr
Kirk Borne	Principal data scientist, Booz Allen Hamilton	http://www.ibmbigdatahub.com/big-data-analytics-hero/kirk-borne
		https://www.linkedin.com/in/kirkd-borne
Scott Gnau	CTO, Hortonworks	https://www.linkedin.com/in/scott-gnau-0074552
Gregory Piatetsky-Shapiro	Founder, KD Nuggets	http://kdnuggets.com/gps.html
		https://www.linkedin.com/in/gpia-tetsky
Paul Zikopoulos	VP Analytics, IBM	https://ca.linkedin.com/in/paul-zikopoulos-4323607

3.7. Conferences and seminars

The conference and seminar industry plays an important role in the diffusion of management ideas (Kieser, 1997), which has been seen in the context of other management ideas such as the Balanced Scorecard (Ax & Bjørnenak, 2005; Madsen, 2014). Table 12 shows that there are currently many conferences centered around BD and related themes. There are many powerful and high-profile actors who back these conferences (e.g. HP). Case in point is the fact that President Obama gave a keynote address at Strata + Hadoop World 2015 (YouTube, 2015). These conferences usually offer a number of sub-themes and activities, as well as exhibit halls where vendors of BD software (e.g. SAP) present their solutions. For example, the Global Big Data Conference has several sub-streams such as “Big Data Bootcamp,” “Big Data for Executives,” and “Big Data Developer Conference.”

3.8. Social media

Social media platforms have, in recent years, become important channels for the diffusion of management concepts and ideas (Madsen & Slåtten, 2015b). In this section, we will take a closer look at how BD has been promoted and disseminated via social media platforms such as Twitter and LinkedIn.

3.8.1. Twitter

BD is currently getting a lot of attention on Twitter. The following hashtags are frequently used in discussions of BD: #BigData, #Analytics, #DataMining, and #DataScience. Several articles have also ranked the most important BD opinion leaders on Twitter. For example, BD “pros on Twitter” (Casey, 2014), “33 data scientists on Twitter” (NT, 2014) or “Big Data executives to follow on Twitter” (Bhushan, 2014). Table 13 provides examples of influential Twitter users in relation to BD. As can be

Table 11. Examples of recent books about BD

Book title	Reference
Big Data for Dummies	Hurwitz, Nugent, Halper, and Kaufman (2013)
Disruptive Possibilities: How Big Data Changes Everything	Needham (2013)
Big Data: A Revolution That Will Transform How We Live, Work, and Think	Mayer-Schönberger and Cukier (2013)
Big Data: Principles and best practices of scalable real-time data systems	Marz and Warren (2015)
Big Data: Understanding How Data Powers Big Business	Schmarzo (2013)
The Big Data-Driven Business: How to Use Big Data to Win Customers, Beat Competitors, and Boost Profits	Glass and Callahan (2014)
From Big Data to Big Profits: Success with Data and Analytics	Walker (2015)
Big Data Analytics: Turning Big Data into Big Money	Ohlhorst (2012)
Big Data: using SMART big data, analytics and metrics to make better decisions and improve performance	Marr (2015)
Big Data For Small Business For Dummies	Marr (2016a)
Big Data in Practice: How 45 successful companies used big data analytics to deliver extraordinary	Marr (2016b)

Table 12. Examples of Big Data conferences in 2015

Conference	Web link
BigData Techcon	http://www.bigdatatechcon.com/
Global Big Data Conference	http://globalbigdataconference.com/
Data Summit—Unleash the Power of Your Data	http://www.dbta.com/DataSummit/2016/
Strata—Hadoop World	https://www.youtube.com/watch?list=PL055Epbe6d5aWZSOZAZ4MX5xXKEvT6y_&v=vbb-AjiXyh0
IndyBigData	http://www.indybigdata.com/
HP Big Data Conference	http://h71056.www7.hp.com/bdc/overview.html

seen, some of these Twitter users have more than 100,000 followers, which means that their messages can be reached by a potentially very large audience (e.g. via retweets).

3.8.2. LinkedIn

LinkedIn is another social media platform which is important in the diffusion and popularization of BD. Prior research has shown that many professionals are actively using LinkedIn (Skeels & Grudin, 2009). There is a large LinkedIn community of IT professionals and data scientists, and there is reason to believe that IT professionals are overrepresented on social media and were early adopters of social media platforms. It has also been found that groups related to BD are fast-growing on LinkedIn (Piatetsky, 2014). Table 14 shows that some of these groups have high membership numbers, in one case more than 200,000 members.

4. The demand side of Big Data

The demand side consists of organizations and managers considering adopting and implementing BD. On the demand side, there has been a rapid increase in the interest, awareness, and adoption of BD among managers and organizations.

4.1. Interest and awareness

One way to evaluate the interest in BD is to use Google Trends, which is an analytic tool which monitors Google search behavior (Choi & Varian, 2012). Search behavior can be seen as an indicator of present and future behavior (cf. Choi & Varian, 2012; Wu & Brynjolfsson, 2009). Therefore, it is possible that spikes in searches for BD can indicate future adoption behavior. As can be seen from Figure 3, interest in BD has grown rapidly during the last few years. There was hardly any search activity in relation to BD until 2007, and the interest did not start to take off until 2011. Since 2011, search activity in relation to BD has intensified quickly, and the interest in BD is currently at the highest level to date.

Table 13. Examples of influential Twitter users in relation to BD

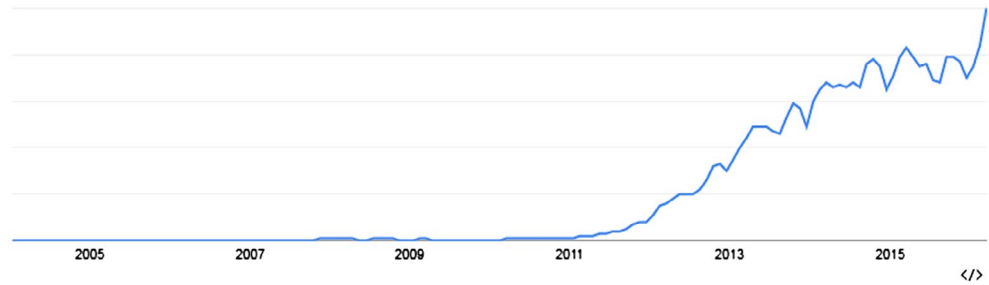
Twitter user	Twitter handle	Followers	Web link
Big Data Opines	@BigDataBlogs	40K	https://twitter.com/BigDataBlogs
Big Data Innovation	@IE_BigData	22K	https://twitter.com/IE_BigData
IBM Big Data	@IBMbigdata	109K	https://twitter.com/IBMbigdata
Gregory Piatetsky	@kdnuggets	46K	https://twitter.com/kdnuggets
Big Data Science	@analyticbridge	127K	https://twitter.com/analyticbridge

Table 14. Examples of LinkedIn groups

Group	Members	Web link
Advanced business analytics, data mining and predictive modeling	208K	https://www.linkedin.com/grps?displaySettings=&gid=35222
Big data analytics strategy finance innovation	140K	https://www.linkedin.com/groups/1814785/profile
Big Data and analytics	165K	https://www.linkedin.com/groups/4332669/profile
Business analytics and Big Data	87K	https://www.linkedin.com/groups/62438/profile
Business intelligence professionals (BI, Big Data, analytics)	169K	https://www.linkedin.com/groups/40057/profile
Business analytics and Big Data	87K	https://www.linkedin.com/groups/62438/profile

Figure 3. Data.

Source: Google Trends (www.google.com/trends/), Retrieved March 5, 2016.



4.2. Adoption

While the previous section showed that the interest in BD is currently very high, we know considerably less about the actual usage of BD in practice. Bain and Company's aforementioned survey of management tools indicates that BD is the 11th most widely used management tool among managers worldwide (Rigby & Bilodeau, 2015), up from 17th two years prior (Rigby & Bilodeau, 2013).

5. Discussion

In this part, we discuss the findings in relation to the literature on BD and current debates in the literature on management fashions. First, we address the question of whether BD can be considered a management fashion. Second, we look at cooperation and links between actors involved in the BD fashion-arena, which could explain its rapid diffusion and popularization. Third, we discuss the role of social media in the dissemination and diffusion of BD. Finally, the relationships between social media and BD are explored, as these two phenomena can be considered close cousins.

5.1. BD as a management fashion

5.1.1. Hallmarks of fashions

The first question addresses the question of whether BD can be considered a management fashion. As noted by Bukh et al. (2015), some academics worry that BD could be just another passing management fad. The analysis in the current paper shows that BD exhibits several of the hallmarks of a management fashion. There is certainly a fashion aspect to BD's almost meteoric rise to prominence in the business community. BD currently is an "explosive" and highly contagious management idea. Many commentators have noted that is "big business" and a contemporary buzzword. Following Jung and Kieser's (2012, p. 329) definition, BD certainly is a management fashion since the data indicate that it very quickly has garnered tremendous interest and has a dominant place in public management discourse and in many sectors of society.

In addition, BD exhibits other hallmarks of a typical management fashion, such as the backing of a broad spectrum of supply side actors. The data show that there is a diverse constellation of supply side actors actively promoting and backing BD. In particular, IT and business analytics firms have played important roles in the BD fashion arena. However, there have also been a number of other supporting actors involved. The data show intensive supply side discourse about BD, and an explosive growth in the number of academic articles on BD in recent years, as well as a plethora of best-selling practitioner-oriented management books touting the merits of BD.

5.1.2. Institutionalization

There are many signs that indicate a field-level institutionalization of BD, e.g. take-up of BD by elite educational institutions as well as the launching of academic journals focusing specifically on BD research. Moreover, the fact that highly influential individuals such as President Obama are delivering keynote addresses in BD conferences shows the widespread legitimacy of the topic in business and society. The analysis of the demand side shows a similar explosion in the interest in BD. The currently high level of interest could possibly be seen as an indicator of future demand and adoption

behavior by organizations and managers on the demand side. Although BD use seems to be on an upward trajectory (Rigby & Bilodeau, 2015), there is little conclusive evidence on the take-up of BD in practice.

5.1.3. Life cycle and lifespan

The traditional assumption in the management fashion literature is that management fashions are temporary phenomena. While some argue that BD already has peaked (Needle, 2015), it is still unclear whether it has reached a stage of maturity. Will the interest continue to increase or will it enter a downturn phase? The conventional management fashion view posits that the interest in BD will ultimately wane over time. However, in recent management fashion research, it is recognized that fashionable concepts and ideas may become institutionalized (Perkmann & Spicer, 2008). It has also been noted that some management ideas and practices may be “stickier” than others (cf. Colyvas & Jonsson, 2011).

The data presented in this paper lend some support to the view that BD could have some staying power. There are early signs of institutionalization of the BD term both in the business community and in academic circles. The activities and institutional work (Perkmann & Spicer, 2008) carried out by the supply side of BD could help make BD a more permanent and “enduring management fashion” (see also Grant, 2011).

5.2. Cooperation and linkages between BD fashion-arena actors

Another interesting theme is related to the role of cooperation and linkages between different actors involved in the BD fashion-arena. The data show that there “are formal and informal alliances” between actors in consulting and academia (e.g. Accenture/MIT alliance), between software solution providers (e.g. SAP and SAS), as well as between IT firms and conference organizers (e.g. HP’s BD conferences). In addition, opinion leaders play important roles in the BD field, and are heavily involved in both conventional brick and mortar outlets (e.g. conferences), and on social media platforms such as LinkedIn and Twitter.

5.3. Social media and the popularization of BD

Recent research indicates that the role of social media platforms in the diffusion of management concepts and ideas is growing in importance (Madsen & Slåtten, 2015b). The data presented in this paper show that many more actors are involved in online BD discourse than what has been seen to date in the cases of other management concepts such as the Balanced Scorecard, Beyond Budgeting, and TQM (Madsen & Slåtten, 2015b). The broad spectrum of actors involved has contributed to making the social media discourse around BD very intense.

5.4. Social media and BD—close cousins?

Social media (e.g. online social communities) and BD are arguably close cousins. In some ways, BD has fed off of the popularity of social media. The growth of different types of social media platforms (e.g. Facebook and Twitter) have massively increased the amount of data available for analysis. This has led to the development of “social media analytics” (Leskovec, 2011), one of several BD analytics techniques (Gandomi & Haider, 2015).

Another interesting observation is that the rise of BD coincides to a large degree with the rise of social media in the general public. As noted, BD gained legitimacy in the late 2000s, and started taking off around 2011–2012. Similarly, social media platforms (sometimes referred to as Web 2.0) starting picking up momentum in the mid- to late 2000s (Arora, 2014; Cormode & Krishnamurthy, 2008).

6. Conclusion

6.1. Findings and contributions

The current paper has utilized the management fashion theory as a theoretical lens and sensitizing framework to understand the popularization of BD. To the best of our knowledge, this theory has not previously been utilized in the context of BD. This analytical lens has a natural fit given that several commentators have pointed out the considerable buzz and hype surrounding BD, as well as the many different types of supply side actors with commercial interests tied to the success of BD.

In this paper, we have shown that the roots of BD go back as far as the late 1990s. However, it was not until the mid- to late 2000s that BD gained momentum and widespread legitimacy. BD's rise in popularity was propelled by technology firms and consulting firms. In 2011 and 2012, BD "took off" both in terms of publications of books and articles as well as interest measured by Google data. BD is currently perhaps the strongest buzzword in the business community. BD enjoys a high level of legitimacy and has a dominant position in different sectors of society. This makes it a powerful mobilizing metaphor and visionary object which it is very difficult to be against.

6.2. Limitations

Our paper has a number of limitations which should be considered carefully. The analysis in this paper is exploratory and somewhat speculative in nature. The objective of our paper has been to provide a new perspective on the diffusion and popularization of BD. Hence, it is prudent to exercise some caution in interpreting the results and conclusions. Furthermore, some readers may also react to the use of the "fashion" metaphor since it carries negative connotations (e.g. managerial irrationality). The authors are not ruling out that BD could be useful in different sectors of society. The fashion perspective is mainly used as an analytical lens to understand the diffusion and popularization of BD.

6.3. Future work

The paper ends with suggestions for further studies of BD from a management fashion perspective. The fact that BD still in the relatively early stages of its life cycle means that opportunities for follow-up studies are plentiful. For example, it will be interesting to see what happens to BD a few years down the road. Will the high level of interest be sustained or will the interest wane? Will the typical bell-shaped management fashion curve materialize in the future?

Another possibility for future research on BD is to study the future evolution in real time. Will BD continue its current growth trajectory? Typically, studies of fads and fashions suffer from a selection bias as they sample on the dependent variable (Denrell & Kovács, 2015). Fashion researchers tend to focus on concepts and ideas that used to be popular, e.g. "rise and fall" studies (Denrell & Kovács, 2015). Since BD is still early in its life cycle (still on the rise), it is not clear what the outcome of the diffusion process will be. Another idea for future research would be to study the trajectory of ideas similar to BD but which did not succeed in becoming popular. For example, why did suppliers of BD succeed in connecting with the "zeitgeist" while suppliers of other similar (less successful) concepts and ideas did not?

Future studies should combine supply side and demand side perspectives on BD. This means not only studying the discourse in print and social media, but also the extent to which BD is actually used on the demand side. Our present study has not been able to shed much light on the use of BD in organizational practice. Surveys and case studies would be useful for investigating how BD is actually used in organizations. In addition, qualitative studies could also shed light on the motivations for adopting BD, as well as general experiences associated with adopting and implementing BD.

Researchers have pointed out that there are both “promise and peril” associated with BD (Bollier & Firestone, 2010). There are many possible implication difficulties; therefore, it is unclear whether BD is the “the perfect wave” that organizations have been looking for (cf. Birkinshaw, 2014). There is also as noted by Boellstorff (2013) much hype and hullabaloo surrounding BD. IT fashions such as BD typically reach a disillusionment phase after they fail to live up to the often very high expectations (Linden & Fenn, 2003). In the management fashion literature, it is pointed out that negative experiences may surface later in the life cycle and could contaminate and “wear out” concepts and ideas such as BD (cf. Benders & Van Veen, 2001). A key research question for future research would therefore be to explore the extent to which BD is able to live up to its promises, and find out why some organizations are better able to capitalize on innovative ideas than others (cf. Birkinshaw, 2014).

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Notes

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