Big Data Analytics Capability and Sustainability: A Systematic Literature Review

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ABSTRACT

Big data analytics capabilities (BDAC) have been considered a pivotal means of transforming business data into valuable business insights to bring a competitive advantage. This paper aims to provide a systematic literature review to demonstrate the existing empirical investigations on the impact of BDAC on sustainability. The search strategy resulted in 289 studies, of which 59 were shortlisted for review through a stringent quality rubric. The findings indicate that BDAC research is still in its early stage, and there is no consensus on a list of capabilities required to form BDAC. The study also reveals that existing BDAC investigations were mainly conducted in a developed country context, and the impact of BDAC on sustainability is largely unexplored. The main BDAC research interests are focused on firm's performance, innovation, and supply chain competitiveness. The study proposes several research gaps.

Keywords BDAC, Sustainability, BDA.

I. INTRODUCTION

Big Data Analytics Capability (BDAC) is widely accepted as a skill set to transform how firms usually do business [1]. Considering the perceived benefits of Big Data Analytics (BDA), firms invest heavily in BDA, making it a pivotal asset for business leaders who prefer making data-driven decisions instead of just following their organizations' instructions [2]. However, prior studies identified that investments alone do not guarantee a competitive advantage for firms, rather combining resources to form BDAC leads to a superior firms' performance [3]. For the last decade, scholars and practitioners have investigated the link between BDA deployment and the competitive advantage achieved [4]. Significant progress has been achieved at the firm level through BDAC concepts [5-7]. However, there is still a limited understanding of how BDA projects' internal dynamics enhance analytical capability or, better to say, BDAC deployment [4].

BDA adoption enhances an,organization's capability in a competitive dynamic market environment [8]. However, BDA practitioners face severe difficulties in understanding the essential capabilities required to transform data into a firm's performance [2]. On top of that, investigation of BDAC's impact on sustainability performance is scarce. Even though a few studies have been found, most of these studies offer a conceptual framework rather than empirical evidence and empirical studies on the role of BDAC on all three sustainability dimensions: Economic, Social and Environment of sustainably are scant [9]. A comprehensive systematic review is required to identify the current extant knowledge in BDAC and the sustainability research agenda. Therefore, this paper aims to review the existing empirical investigations on the impact of BDAC on sustainability. We will address the missing link by summarizing different conceptualized dimensions of BDAC and Sustainability. To fulfil the study objective, we have framed the following research questions:

1) What are the capabilities required to build BDAC?

2) Which sectors and countries have BDAC research expanded so far?

3) What are the issues (input/output / mediating/moderating variables) empirically tested due to building BDAC?

4) What are the research gaps for future research agendas related to BDAC and sustainability?

The research aimed to extract existing extant knowledge within the window of "big data", "big data analytics", "BDAC", and "Sustainability" keywords. Therefore, there is a chance of extraction omission of other closely related studies.

II. BACKGROUND

The vast volume of data generated by business stakeholders poses a paradigm shift from how a firm manages its data to how it makes fruitful decisions [10]. So, firms are continually searching for tools

with a phenomenal level of sophistication to leverage the power of big data. Accordingly, we have seen different tools such as "Business Intelligence (BI)", "Business Analytics (BA)", and "Big Data Analytics (BDA)" were introduced. BA combines techniques, technology, methodologies, applications and practices that enable business firms to analyze critical business data [11]. Hence, BA's main focus is on business operational statistics and analytics, not contextualizing operation data in broader sectors and market data. To supplement this limitation of BA, a new concept, BDA, emerged that gradually matured and was widely adopted across business firms [6]. BDA guarantees to generate business value by transforming data into sound business knowledge facilitating efficient decision-making, thereby improving a 'firm's performance [12]. However, value depends on the 'firms' ability to capture, store, and analyze a large volume of complex data set that are generated from both real and near-real situations. Consequently, a new research pursuit has emerged, named BDAC [13]. Several researchers have started studying different aspects of BDAC to make the research field mature [2].

BDAC is the competence of a firm to provide business insights by capturing and analyzing big data. In doing so, BDAC holistically utilizes a 'firm's data, technology, and talent as an organization-wide process [1, 3, 14]. A recent study suggests that BDAC positively contributes to the sustainability of organizational development [15]. Past studies on BDA show that BDA positively influences all three aspects of sustainability [16]. Besides technology, management and leadership style, policies, supplier and customer integration, and internal business process integration significantly influence supply chain sustainability practices [17]. So, building BDAC is paramount to making BDA useful for sustainability. The primary objective of this systematic review is to investigate the advancement and research works in the BDAC domain, particularly its contribution toward sustainability. To fulfil the objectives, we have reviewed the top three most receptive research outlets, Google Scholars, SCOPUS and Web of Science. Peer-reviewed articles that passed our quality rubric were only considered. Renowned publishers who provide access to high-quality research articles on many knowledge disciplines were considered for our review. Maintaining a strict quality framework in journal selection following a well-established systematic literature review procedure finally produced an exhaustive list of high-quality articles on the BDAC domain. The detailed procedure is demonstrated in the next section.

III. METHODOLOGY

Different researchers have coined different SLR approaches, keeping the main objective intact. For our study, a multi-step SLR approach is used to avoid the pitfalls of just analysis and synthesis of an article [18]. Thematic analysis is vital for a further conceptualization of the research agenda. Accordingly, the combined research approach is supplemented with thematic analysis to conceptualize BDAC with BDA practices in the supply chain. Our combined approach consists of three main stages. In stage one: we conceptualize the key terminologies and define the scope of the study. In stage two (literature search), we followed an established four-step SLR searching procedure [19]. The final stage of the method entails analysis and synthesis of the candidate articles found in stage two and, finally, reporting results. In congruence with the SLR approach we adopted, the following table summarizes the scope definition and development of the protocol for the actual literature search.

Table 1. Study inclusion and exclusion criteria

Features	Big Data Analytics Capability	Sustainability
Research Question:	RQ1, RQ2, RQ3	RQ4
Search criteria	ALL (*bda* OR *bdac* AND *capabilit** AND *""Big Data""*) AND PUBYEAR > *2010* AND (LIMIT-TO (DOCTYPE , *""ar""*)) AND (LIMIT-TO (LANGUAGE , *""English""*))	(ALL (*sustainable* OR *sustainability*) AND PUBYEAR > *2010*) AND ((((*BDAC*)) AND (*""big data""*)) OR (*""performance""*)) AND (*bda*) AND (LIMIT-TO (DOCTYPE , *""ar""*)) AND (LIMIT-TO (LANGUAGE , *""English""*))
Article retrieved	Scopus (200), WoS (221), Google Scholars (238)	Scopus (45), WoS (32), Google Scholars (35)
After 1st screening	256 (136)*	36(17)
After 2nd screening	96(57)**	8(5)

*after removing duplication (after initial screening by reading title only); **after abstract analysis (after full-text analysis)

In some recent studies, investigators used "data-oriented" or "data-driven" keywords instead of "big data". To make our search result more inclusive, we further extended the search process replacing "big data" keywords with "data-oriented" and "data-driven" keywords, respectively. Through this search, we have found three more candidate studies that fit our scope and added them accordingly. Those articles have also been incorporated in the descriptive statistics section.

A pilot search of journals and research papers was conducted on 15 November 2020 and later updated on 20 March 2023. Efforts were made to find the most quality work in BDAC and sustainability. BDAC terminology was mainly coined in 2000. So the journal papers indexed in SCOPUS, WoS and Google Scholars database since 2000 is considered for the literature review. After the search process generated a bibliography of candidate studies, some studies were eliminated at the very outset if they fit one or more exclusion criteria. The remaining papers were thoroughly studied for further inclusion or exclusions. Some papers were excluded at this stage because they did not have sufficient statistics to identify impact and contributions, even though they met all inclusion criteria. A quality rubric introduced by [20] is used to evaluate each 'article's quality. The rubric examines research articles on seven criteria, including Objectives, Literature review, Theoretical framework, Study participants, methodology used, Results and discussion, and Significance of the study. Each quality rubric component was measured on a scale of zero to three, where 0= Below standard, 1=Near to standard, 2= Standard, and 3= Exceeds standard (Detailed criteria are skipped due to page limit). Articles' overall scores of more than nine [20] are shortlisted for further review. Articles scored below, or equal to nine, are considered ""Poor"" and ""Inadequate"" articles and were excluded. A total of 59 research studies are finalized for further analysis and review.

IV. FINDINGS AND ANALYSIS

A. Descriptive statistics

Firms build competitive advantage through internal resources; however, having big data as a resource does not necessarily increase BDA capability [3]. Consequently, we see a new addition to 'BDAC's research stream in the existing big data research. The number of investigations is gradually increasing, and we have seen sixteen in the last year. The number of articles published in the year 2021 so far is 12.

Associated barriers and hindrances in adopting BDA in developing countries are significantly different from those of developed countries [21]. The success of BDA adoption is significantly affected by the 'country's context and culture [22]. However, from our literature findings, most BDAC studies are confined to developed nations. Almost 82% of studies are limited to Organization for Economic Co-operation and Development (OECD) countries. While the highest number of studies are being carried out in the business management area, total aggregate studies in science and engineering surpass all other areas with a big margin. BDA has the power to revolutionize every business sector [23]. So BDAC studies should extend to diversified fields. Particularly it will enable business managers to compare the results and make the most accurate decision to befit their business. The highest number of articles published in the business management domain is also reflected in the findings of the highest number of articles published in the journal of business research.

Existing BDAC studies adopted different theories as a literature foundation with a predomination of the resource-based view (RBV) theory. Almost every investigation considered big data and BDAC as an internal resource of the firm. Hence, investigators are mostly prejudiced to see the BDAC through the resource-based lens. The main justification investigator argues for adopting the RBV as the underpinning theory is its extreme usefulness in explaining firm performance and exploring the development of BDAC capabilities [24]. The second most used theory in the existing literature is the Dynamic Capabilities View (DCV) theory. Researchers considered the DCV theory as an extension of the RBV theory in explaining 'firms' actions to remain competitive in the long run in a continually changing turbulent environment [25]. Whereas most of the studies on BDAC are RBV and DCV theory, sustainability studies also viewed BDAC from a different theoretical perspective apart from the RBV and DCV, such as information processing theory [26], sustainable development theory [15], contingency theory [9] socio-materialism [1].

Table 2: Articles those adopted DCV and RBV approaches

Name of theories	Studies
Dynamic Capability Theory	[25];[27];[28];[29];[8];[30];[24];[31];[32];[9]
Resource Based Theory	[33];[34];[27];[28];[1]; [5];[6];[12];[35];[13];[14];[36];[37];[9];[3]

B. RQ1: What are the capabilities required to build BDAC?

BDA capabilities in organizations have become the most niche research agenda in the big data field [38]. Some recent investigation identifies that having just BDA is insufficient to yield competitive advantages [3]. A balanced BDA capability of different dimensions and synchronization of all those capabilities is a prerequisite to getting maximum return from the BDA investment [39]. However, there is still no consensus on the types of BDA capabilities. Different BDAC taxonomies have been offered. There is a near consensus among all BDAC frameworks that BDAC consists of three capabilities: BDA Infrastructure Capability, BDA

Talent Capability, and BDA Management Capability. However, there is a slight variant among the sub-components under these three broad capabilities in different taxonomies in the existing literature. Table 2 summarizes the different components of the three major capabilities of BDAC.

Table 3: Capabilities reported to form BDAC

Capability Type	Components
BDA Infrastructure Capability	Data [40, 41], Infrastructure [23], Platform [41], Tangible asset [6, 7, 19, 40, 42], Modularity [14], Compatibility [14, 43], Connectivity [14], Technology [6, 7, 40, 43, 44]
BDA Talent Capability	People [41], Data Scientists [45], BDA Personal Expertise [23], Human Skills [6, 7, 40], Managerial decision making talent [14], Analytical talent [43], technical talent [14, 43]
BDA Management Capability	Analytics management [43, 45], Tangible asset [40], Strategy [46], Management capabilities [14, 23]

C. RQ2: In which sectors and countries have BDAC research expanded so far?

Studies in BDAC highly concentrated on the manufacturing sector and retail sectors. Few studies focused on the service sector; studies in healthcare are even scarcer. The only study in our literature focusing on BDA in healthcare investigated the causal relationship between BDAC and healthcare business value and identified the value chain path for BDA implementation success in the UK [37]. This study could be a guide to conducting similar empirical testing in a developing country context.

Table 4: Studies were done on major sectors

Sector	Studies
Manufacturing	[26]; [15]; [39]; [34]; [29];[47]; [9];[48]; [31];
Service	[27]; [33]; [29]; [22];
Combined	[25]; [40]; [1]; [5-7]; [12]; [30]; [23]; [14]; [3]; [32]; [49];[23]

D. Studies by country context

Building the BDA capabilities is the prime focus of existing BDA research (Espinosa and Armour 2016). However, studies revealed that BDA would continue to be widely adopted, but post-BDA success will diminish over time, and data management challenges will be overwhelmingly challenging and costly [43]). Thus, BDAC studies require investigations in different contexts, sectors, and cultures, considering all interdependent or mediating actors in BDA implementation success. It is widely accepted that any digital 'transformation's success factors vary from context to context, so investigations in the context of both developed and developing countries. Our findings revealed that BDAC literature is highly concentrated in developed countries. Seventy-nine per cent of our candidate studies are exclusively conducted in developed countries.

Table 5: Studies conducted on socioeconomic conditions

Context	Studies
Developed Country	[26]; [15];[25]; [15];[39];[34];[1]; [12];[35];[13];[30];[23];[14];[5-7];[36];[49];[32];[3];[48] [37]
Developing Country	[40];[33];[27];[28];[29];[47];[24];[31];[9];
Both	[11];[22];

E. RQ3: What are the issues (input/output/mediating/moderating variables) empirically tested due to building BDAC?

The existing BDAC literature primarily concentrates on the straight anecdotal relationship between BDAC and Firm Performance; however, BDA pays off for some companies but not others. [1]. Different sectoral and context-based intermediate role players exist between BDAC and the firm's performance. Some studies have focused on mediating roles of different factors in the relational path of BDAC and a 'firm's performance. We have summarized the studied mediating factors and their role identified in empirical studies. After analyzing the candidate articles, we found that all of the investigations fall

under four broad categories. 1) Articles where BDAC is input and sustainability is output, 2) Articles where BDAC is input and Firm Performance (FP) is output, and 3) Articles where BDAC is input and innovation is output

a) Articles where BDAC is input and sustainability is output

A total of seven articles investigated the supply chain as output. Two more investigations [8, 13] investigated the sustainability of innovation and organizational development and sustainable competitive advantage, respectively. However, these two investigations are more related to 'firms' profit than the social and environmental aspects of sustainability. Three articles addressed supply chain sustainability; however, no articles investigated all three aspects: economic, social, and environmental sustainability.

Table 6: Articles where BDAC is input and sustainability is output

Mediator or Moderator metrics	Sustainability output metrics
Innovation process: Sustainability design [15], Commercialization [15], Innovative green product development [31], Supply Chain Innovativeness[31], Innovation and Learning Performance [31], Organizational Practice: GM Practice [36], LSS efforts [36], Employee Development[31], Supply chain: Supply Chain Complexity [9]	Firm-level sustainability: Innovativeness [26], Success of Sustainability Development Project [15], Air pollution Management [35], Environmental Performance [36], Supply Chain Sustainability: [9, 31, 47]

b) Articles where BDAC is input and FP is output

It is widely accepted that BDA is a true game-changer enabling higher business efficiency due to its highly strategic and operational potential [14]. This claim is further evidenced in our findings of the highest number of investigations on 'BDAC's impact on firm performance. All the investigations reported a positive impact of BDAC on the 'firms' performance. However, investigations are mainly conducted in developed 'countries' manufacturing sectors. To validate the findings for broader applicability, investigation in different service sectors and geographical contexts is required.

Table 7: Articles, where BDAC is input and FP is output

Category	Mediator and Moderator Metrics	FP Metric
Managerial orientations	Control Orientation [50] , Flexible Orientation [50]	Firm performance [1, 3, 7, 12, 14, 22, 23, 27, 28, 34, 48], Decision Making Performance [39], Collaborative Performance [50] New Product Development Performance [49]
Culture	Organizational culture [22, 27, 32]	
Capability	Dynamic Capability [14, 34], Analytics Capability [1], Innovation Capability [8]	
Organizational features	Organizational Agility, organizational ambidexterity [23, 51], Organizational Resistance to information management [23, 51], Organization information management system-Fit/ Swift Trust [29, 52]	
Innovations	Innovative Green Product Development [8], Innovation and learning performance [22], Continuous Process Innovation [53]	
Supply chain	Supply Chain Innovativeness [31], Supply Chain Complexity [9]	
Internal factors	Data Availability [8], Internal analytical knowledge and Management [12, 27], GM Practice, LSS Effort [36], Competitive Advantage [22], Employee Development [31]	
BDA	Big Data Analytics Components, BDAC, Benefit Dimension [37]	

c) Articles where BDAC is input and innovation is output

Big data is considered the next frontier of innovation, and firms can leverage 'BDAC's power in implementing user-centred and user-driven innovation [25]. A few studies investigated the impacts of BDAC on innovation. One of them studied eco-innovation and identified the positive influence of BDAC in reducing CO2 emissions [33]. Service innovation [30], business model innovation [25], and incremental innovation [5] are the rest three articles that investigate innovation output as a consequence of achieving BDAC. The use of big data within firms broadens the business innovation boundaries; hence, it is now common for firms to use big data within their innovation process [40]. However, considering the widespread adoption of big data within diverse firms, the number of articles investigating the impact of BDAC on innovation is very low. So, it is particularly crucial to investigate the impacts of big data in-depth on business co-innovation [21].

Table 8: Articles where BDAC is input and innovation is output

Category	Mediator and Moderator Metrics	Innovation Metric
Managerial orientations:	Entrepreneurial orientation [25]	**Innovation** Business Model Innovation [25] Incremental innovative capabilities, radical innovative capabilities [5] Service Innovation[30]
Capability:	Dynamic Capability [6], Innovation Capability [30], Digital Platform Capabilities [30]	
Organizational features:	Environmental Dynamism [30]	
Internal factors:	Information Governance [5]	
External factors:	Environmental Uncertainty[5] [6] Environment [7]	

***Table 9: Articles** by research method*

Research Methods	Number of Articles
Quantitative	26
Qualitative	16
Mixed	17

We have noticed that innovation capability is a highly studied mediator or moderator, and results show that an organization's innovation capability highly influences forming BDAC [13, 25]. We have also noticed that external factors mediate or moderate a firm's innovation more than the firm's performance [5].

F. Validity of the Methods

Validity in qualitative research refers to the "appropriateness" of the tools, data, and processes used in any investigating [54]. To enhance the validity of our SLR methods, we have chosen empirically proven SLR methods where systematic sampling has no a priori theory [55, 56]. For example, different search streams were used for data extraction and analysis to enhance the validity [19, 57]. To increase the validity of the sample size, a stringent quality rubric was applied to all candidate studies before selecting them for further analysis.

G. What are the research gaps for future research agendas related to BDAC and sustainability

Our findings indicate four major literature gaps, namely (1) Formulating a universally accepted building block of BDAC, (2) Understanding the impact of BDAC on sustainability performance, (3) Investigating BDAC in developing countries, (4) Expanding BDAC research into the service sector. We believe these gaps could inspire researchers in the BDAC field.

a) Formulating a universally accepted building block of BDAC

Quite a few research frameworks exist defining the building block of BDAC. However, still, there are differences in the categorizing of BDAC resources. A literature survey reveals several approaches to defining and assessing BDAC; therefore, it is conceptualized as a unidimensional construct [29, 50, 52, 58-60] to comprise a multi-dimensional higher-order construct [1, 3, 14]. A combination of mixed approaches is also found. For example, [40] used second-order human capability constructs to form two second-layer constructs extended to the third-order to form the first-order construct BDAC eventually. In prior research, BDAC is explained by a two-dimensional characteristic, namely, BDA technological capability (BDAT). The latter refers to a data 'analyst's ability to combine managerial and technical skills and BDA personnel capability (BDAP), which refers to the BDA infrastructure strengths of the firms [30]. In another study, [49] theorizes the BDAC concepts are slightly different from the previous one, namely BDA technology capability and BDA management capability. BDA technology capability is theorized in those studies as represented by a firm's BDA platform flexibility, enabling analysts to quickly develop and deploy the firm's resources [1]. Our literature review analysis found that 'BDAC's most accepted and established theory is based on three building blocks: BDA technology capability, BDA management capability, and BDA talent capability [1, 28]. Apart from the established there building blocks of BDAC, there are several investigations that theorize two other concepts as intangible characteristics of BDAC, namely ''data-driven 'culture' [2, 39] and ''intensity of organizational learning [2]". So still, there is no settled theory of measuring BDAC.

b) Understanding the impact of BDAC on sustainability performance

Prior research investigations suggest that BDA and BDAC improve sustainable performance [26]. Only six studies covered sustainability issues, which is very nominal considering the sustainability and diversity of different sectors. Studies by [26] found

that the BDA and BDAC highly influence the organization's sustainable innovativeness. The study covers an empirical sample from three developed countries to increase the study's findings' cross-national generalizability. Past studies in BDAC show improvement in innovation sustainably [26], air pollution controlling [35], pharmaceutical supply chain sustainability [47], and supply chain sustainability [9]. Adopting BDA and being equipped with BDAC are two different research areas. Past research mainly focused on the BDA effect on sustainability or a combined approach of BDA and BDAC on sustainability [16, 26]. Studies investigating the relation between BDAC and supply chain sustainability hypothesized sustainability output construct from the mission and vision of sustainability perspective [9]. Studies investigated BDAC and sustainability relation from different sustainability dimensions such as environment only [35], innovativeness sustainability[26], and sustainable growth [15]. However, considering all three fundamental aspects (Economic, Social, and Environment) of sustainability together is rarely discussed in BDAC literature.

c) Investigating BDAC in developing countries

Barriers to big data adoption are separate from those of developed nations [21], such as most public sector organizations in developing counties that constrain BDA to suffer from multiple organizational problems, the same study revealed. Leveraging BDA success through a firm's performance depends on its country of origin [22]. Therefore, it is implied that the developing and developed country contexts are very different. However, among the few BDAC empirical research available in the 'world's three most receptive research outlets, we found that most of them are developing nation-focused. Therefore, more BDAC studies on developing country contexts are required to compare cross-cultural similarities and dissimilarities in BDAC issues. Besides the scarce articles in the developing country context, BDAC and sustainability in developing countries are not investigated, as our literature survey revealed. Considering the potential of 'BDA's capability to address sustainable development issues, some researchers have started developing BDA models and algorithm tools. Nevertheless, BDA is still a new concept, and its application in addressing sustainability problems is even newer. [35]. Previous research has studied sustainable innovativeness from the perspective of the firm's capability to process resources and information; however, the relationship between sustainable innovativeness and the firm's knowledge integration mechanism is not linear [26]. Therefore, there is a critical gap in studying the impact of BDAC on sustainable issues in a developing country context.

d) Expanding BDAC research into the service sector

Sectoral context and culture are varied to sector to sector. For example, the healthcare sector is highly regulated, and its supply chain process is completely different from others [61-65]. So health sector may require different BDA capabilities than that of other industries. On top of the due to global COVID situation, healthcare should be addressed from different dimensions to find out how BDAC can help the world tackle the pandemic. The irony is that the BDAC research articles are very limited, and BDAC with a healthcare focus is rarer. Therefore, BDAC research should be expanded to critical sectors related to community well-being, such as healthcare.

V. CONCLUSION

This SLR examined 59 journal articles to demonstrate a pictorial presentation of BDAC and where it is applied. We classified all candidate articles to address the four research questions we developed. Our paper contributes to the literature by shedding light on what it should mean to understand BDAC, its impact on sustainability, and the key future research opportunities to advance knowledge on this topic. The findings reconfirm that BDAC research is still in the early stage. The first exploration based on our SLR confirms that BDAC research is still early, as [19] pointed out in their extensive work in 2017. Our study shows that the coverage of BDAC implementations in various sectors is also missing. Previous studies espouse the novelty of the BDA capability development research theme [11]. Our study complements the different findings of the newness of the BDAC research stream [19], not having a clearly defined notion of BDAC [3], and lack of sufficient knowledge of the capability required to form BDAC [66].

A clear finding emerging from this SLR is that it reconfirms the previous findings of not having a consensus on components of BDAC. Hence it is on the 'manager's onus to consider what type of capabilities are required to form BDAC. Therefore, from a practitioner standpoint, it can be concluded that managers should continually monitor BDAC's alignment and their expectations from BDA implementation [1]. We examined the extant literature focusing on the impact of BDAC on sustainability. The study identifies that even though the impact of BDAC and sustainability is studied, no articles focused on all three dimensions of sustainability. The impact of BDAC on sustainability is largely unexplored. As BDAC becomes more of a staple of modern business operations and less of innovation [40], it will have a phenomenal impact on sustainability practice [13]. Even though increasingly becoming an interesting subject matter, BDAC's impact on sustainability is still not investigated holistically [9, 17, 26].

On the other hand, we found that most of the existing research investigations are empirically tested within the OECD boundaries, and research investigations in developing countries are still nascent. Apart from these findings, the study unearths some trends of current BDAC research, which could also attract the interest of BDAC enthusiasts. For example, we have identified several theories used in the existing literature, which can also explain BDAC in different research contexts. Predominantly RBV and DCV approaches are used in conducting studies on BDAC. However, BDAC is now considered more of a resource or capability point of view; instead, more expansive choices of theoretical positioning are tested, such as information processing and governance ability [5, 26].

The study findings have the potential to contribute to the technology management field. For example, managing disruptive technology requires firm-specific capabilities along with fundamental technical and human capacities [14, 28, 33, 67]. The study summarized empirically tested BDACs required for firm performance in different contexts. Firms can take the BDACs chart to enhance their organizational capacity building for better technology management and thus yield maximum from their technology adoption.

The study has three limitations. Firstly, like many other literature reviews, the article exclusion and inclusion criteria have a judgmental influence. Hence many quality articles have not appeared in the search list with the selected search keywords. Secondly, the article's screening process also has a judgemental impact. Even after more than one writer's effort in shortlisting candidate studies, there is still a chance that some quality articles might have been eliminated. Thirdly, our literature survey is limited to a narrow stream of big data research. We have identified the extent of literature in the context of BDAC and sustainability, which will help to expand BDAC research in different contexts. Therefore, we expect future research will endeavour to bridge the gaps identified.

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