ASIAN BULLETIN OF BIG DATA MANAGEMENT
Vol. 2. Issue 1 (2022)

The Big data artificial intelligence and corporate social performance: The organizational innovation as Mediator

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Chronicle

Article history
Received: July 07, 2021
Received in the revised format: September 09, 2021
Accepted: November 10, 2021
Available online: December 21, 2021

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Abstract

Businesses are under increasing pressure to demonstrate their commitment to Corporate Social Performance (CSP) and fulfill the expectations of their many stakeholders in today's environment. The purpose of this research is to look into the relationship between CSP and Big Data Artificial Intelligence (BDAI), as well as the function of Organizational Innovation (OI) as a mediator in this connection. The Resource-Based View (RBV) paradigm is used in this study, which hypothesizes that BDAI has a positive influence on CSP, and that OI mediates the interaction between these two variables. The study also shows that the implementation of BDAI can allow organizations to collect and analyze huge volumes of data, which can lead to improvements in decision-making, efficiency, and social and environmental performance. The merger of big data analytics and artificial intelligence is referred to as BDAI. Furthermore, by establishing an innovative culture inside an organization and supporting the application of BDAI into the company's operations, OI has the ability to act as a mediator between BDAI and CSP. This study adds to the existing literature on the relationship between BDAI and CSP by shedding light on the significance of OI as a mediator within that framework. The study's conclusions could have far-reaching repercussions for businesses, government decision-makers, and academia. Businesses can improve their CSP by implementing BDAI and OI, and policymakers should encourage firms to utilize BDAI and OI to improve their social and environmental performance. By analyzing the impact of various factors on the link between BDAI, OI, and CSP, researchers can acquire a clearer understanding of the nature of this interaction.

Keywords: Big data, artificial intelligence, corporate social performance

BACKGROUND

Big data and artificial intelligence (AI) emerged as one of the crucial sources to achieve superior organizational performance Zehir et al.,2020; Dubey et al., 2020; Gupta et al., 2020). Evolution in data utilization methods, collaboration and business networking have reported to significantly facilitate the process of data collection and analysis, especially in the case of big data which usually characterizes as data with large variety and volume and requires AI and machine learning to be implement by the firms (Zhang et al., 2020; Dubey et al., 2020). The existing literature on big data utilization highlights that it can further facilitates in elevating the firm's financial performance on average by 6%, although it is not good enough (Müller et al. 2016). Businesses majorly aim to create

economic value and have been identifying other interventions which can be implemented for raising performance standards in every area (Lv, et al.,2022; van de Wetering et al., 2022). Improvement in the performance of an organizational using big data can be achieved by making modifications in machine learning or changes in big data characteristics as well as by adding variation in AI methods that help in big data handling and understanding it (Gligor et al.,2021). There is an agreement and acceptance on the significance of the various data utilization methods, this paper will majorly emphasize on the nature of relationship between big data characteristics and performance.

In order to intensify the overall performance, the legal, economic, ethical, and philanthropic performance of a firm must also be taken into consideration (Chowdhury et al.,2023; Arora et al., 2021). Prior studies suggest that managers have accepted that financial performance of an organization and utilization of big data are positively related, however, there is less clarity about the positive relationship between social performance and utilization of big data (Cappa et al.,2021: Bahrami & Shokouhyar,2022). Conceivably, using big data facilitates in terms of society, its customers and clients. However, lack of understanding exists concerning the use of big data for potential mechanisms which affects corporate social performance, and process of achieving benevolent aims.

Less consideration has been given to understand how big data play its role in corporate social performance (Gupta et al.,2019). Furthermore, they also argued that one such reason is the structure of the industry. Implementation and usage of big data in the companies is relatively a new concept however over the last two decades it gained an enormous amount of recognition. This raises a high concern for its ethical considerations in the private sector (Mikalefet al.,2019). This area still requires intensive research as it is commonly only a matter of subject at court or law enforcement authorities (Sang et al., 2021). Recent findings indicate a positive impact of big data utilization on the overall performance of an organization; studies further noticed that this relationship offers several important implications i.e., both practical and theoretical (Nisar et al.,2021). Such as, to investigate if the use of big data is still an understudied area or it has already been used to enhance the organization's social performance. Understanding its implementation at organizational level will aid in understanding its advantages and also give direction to the policy makers to make appropriate decisions based on the available data.

Literature review

CSP draws attention towards the way organizational activity influences the society (Mikalef et al.,2020). In order to elevate its impact on the environment, firms must make necessary modifications in its organizational activities (Orazalin & Baydauletov,2020). To avail its advantages, following steps need to be taken that includes i) developing relationship with the external stakeholders (such as, firm-customer collaboration or supplier integration); ii) business practices (such as, creating business models), (ii) workplace organization (e.g., hierarchical restructuring in the workplace) (Harjoto et al.,2019). In order to investigate whether using big data leads to innovation and CSP improvement, the organizational learning theory by Brower & Dacin,2020) was incorporated as it fosters the acquisition of information and promotes adaptability and understanding of the different organizational environment. Hypothesis testing involved the data that was collected through the survey from 297 senior and middle level managers in the North America to share their views regarding the use of big data in their firms. Findings suggest theoretical understanding of big data utilization and its' impact along with reviews of senior managers can facilitate in meeting the main objective i.e.,

to enhance the overall performance of an organization. There exists a plethora of problems that a firm encounter. Problems which require to take action includes the moral requirement of a firm that depends on how it influences human functioning. Alonso-Martínez et al. (2020) argue that this moral requirement is not clearly conveyed to the firm. Effectiveness to encounter the social problems faced by various firms depend largely on the problem's depth, breadth, and its magnitude in context to the current situation. Firms that have clearly defined social requirements also pay equal attention to moral duty and utilize the available technological resources that can be beneficial for the needy (Xu & Zeng,2021). Moral requirements can at times be challenging due to the variations that exist among shared institutions, personal interactions, and regional social justice claims, etc. However, distance hinders the process of satisfying social needs, as a result bringing improvement in the firm's CSP can be complicated. Therefore, it can be concluded that CSP majorly relies on the ability of a firm to identify a local morality and then adapt accordingly (Fauser & Utz,2021).

There exists a plethora of definitions for CSP (van et al.,2021), Majority of the literature on social performance revolves around the construct's multidimensional structure which explains different organizational measures to analyze whether social duties of a firm are fulfilled (Sang et al.,2021). According to these models a firm's social performance is a combination of legal, ethical, philanthropic, and economic, expectations of society. The firm's economic dimension emphasizes on the responsibility of a firm to remain profitable, create economic wealth, and to become productive, for the society. According to Carroll (1979), the primary economic duty of a firm is fulfilling the social responsibility as it facilitates in providing employment. The firm's ethical–legal duties comprises of applying ethical norms and codes. Hence, business solely aims to become a law abiding corporate, rather it also draws attention to adopting the appropriate manner i.e., actions that are in line with the society's expectations (Bahrami & Shokouhyar,2022). In CSP, the philanthropic dimension explains the firm's voluntary activities to promote individual and social well-being. Chowdhury et al.(2023) suggest that various potential activities are required for this dimension which can be performed by thoroughly examining the society's social expectations towards firm.

LITERATURE REVIEW

Big data utilization CSR

Since the previous few decades, the significance of big data analytics has been acknowledged by the firms. Therefore, firms have been trying to increase value by utilizing big data (Batistič & van der Laken, 2019). Simply put, big data analytics refers to utilizing data characterized by fast velocity, high volume, and large variety (Ghasemaghaei & Calic, 2020). Literature indicates that utilizing big data means data is processed in enormous amount, where velocity refers to the data processing speed, and variety means data processing various types of data (Mikalef, et al., 2019). Advancements in machine learning, storage capacity, AI, and computer power make it difficult to measure the objective, bigness of data, and user independence. Such as, 1 TB of data that can be 'huge' for one can be small in some other context, however, it may vary according to the context and time. It is one of the important considerations because of the rapid advancements of technology in areas like computation speed, data storage, machine learning and AI. Meanwhile, sensor technological advancements has evolved how much amount, what type of data is gathered and how it is analyzed. Such, as, Tesla collected the data on anti-lock braking, air bag, lane change guidance,

and cruise control for 1 billion miles usage of vehicle (Dubeyet al.,2019). After releasing Model 3 car which is mass-produced and is more affordable, Tesla now aims to collect data even bigger than this. In 2019, a million miles data per day was collected by Tesla worth 7.3 billion annually. In short, the annual data collection by Tesla exceeds from all the data it collected in previous years, which is both heterogeneous and large as compared to the previous data.

According to Fauser and Utz (2021), big data helps in identifying and the relationships among financial and social performance. For instance, implementing pollution prevention policies in a company can facilitate in lowering its cost. Alonso-Martínezet al. (2020) posits that it also facilitates in identifying social needs for a certain area or locale and holds a significant impact on social performance (Brower & Dacin, 2020). Moreover, it aids in investigating the root causes for social problems in comparison to the traditional measures (Nisar et al., 2021), which thus facilitates in highlighting the firm's social duty. Such as, big data in retail industry assists in improving services through keeping track of customers' responses (Mikalef et al., 2020). Moreover, it also helps to find effective solutions for the social problems by understanding the stakeholders' needs and expectations (Ghasemaghaei & Calic,2020).

Organizational Innovation as a Mediator

In Oslo manual, Organization for Economic Cooperation and Development (OECD) is a commonly used classification of innovation (Zehiret al.,2020), that differentiates between process, organization, marketing, and product innovations. The present study will particularly emphasize on organizational innovation as it is mainly concerned with the evolution of internal capabilities of firm and has a significant impact on the overall performance of a firm. Organizational innovation incorporates advanced procedures and methods that a firm uses in its workplace, external relationships, and business practices (Dubeyet al.,2020). When it comes to business environment, it comprises of new and modified methods for organizing and shaping routines and procedures, such as, improving the retention of workers, and establishing best practices. At an organizational workplace, organizational innovation focuses on new and innovative approaches for assigning division of labor and decision-making roles and responsibilities among organizational employees. In context to external relationships, organizational innovation comprises of various outsourcing methods, developing relationships with public institutions and other firms, and integration among firm and suppliers. It differs from other organizational change such as, organizational routine implementation which is novel and have not been used by firms before and emerges resulting from the firm's strategic decision-making (Guptaet al.,2020).

Universally, it has been noticed that innovation improves organizational performance through evolving internal capabilities of firm, such as, assigning distinctive routines that are aligned with the individual skills (Zhanget al.,2020). Usually, it is the knowledge based organizational capabilities which drives superior organizational performance (Lv et al.,2022), therefore it is suggested that learning is critical for the Corporate Social Performance. In learning, innovation facilitates to identify the needs of its stakeholders and originate new firm capabilities to expand and align its capacity with the stakeholders' needs with the help of innovation. van de Wetering et al. (2022) argues that superior capabilities enable firms to quickly respond to the social needs of the stakeholders. A set of firm capabilities that excel its rivals lead to superior CSP. Therefore, a following hypothesis is proposed:

H1: Big data artificial intelligence is positively associated with corporate social performance.
H2: organizational innovation is positively associated with corporate social performance.
H3: organizational innovation mediates between corporate social performance and Big data artificial intelligence

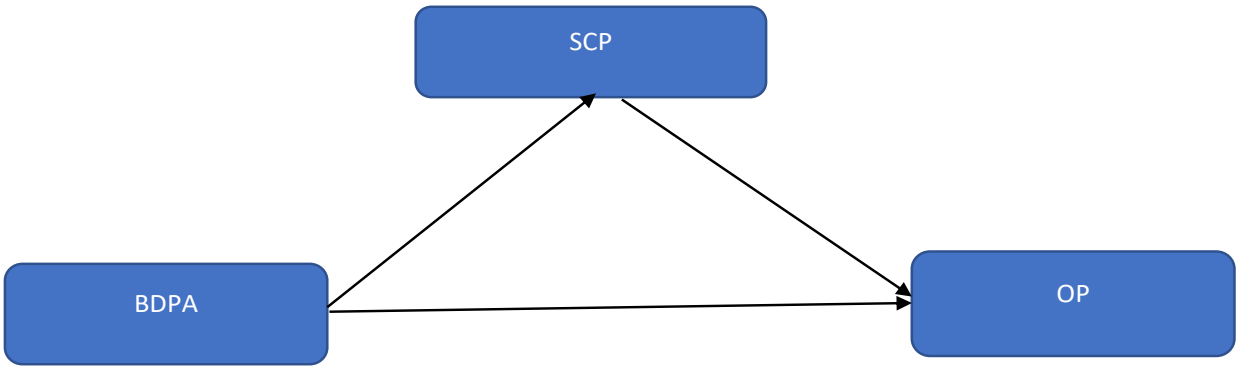

Figure 1.
Conceptual Framework

RESEARCH METHODOLOGY

This study's research strategy used a survey because it provided for the most comprehensive assessment of the relationship between big data AI, CSP, and organizational innovation (OI). The members of the sample were all professionals employed by various sorts of Asian businesses. 300 questionnaires were issued; they had 265 questions meant to analyze the existence of big data AI, CSP, and OI in the respective enterprises. The survey's closed- and open-ended questions were designed to determine the prevalence of AI, CSP, and OI in big data, as well as the nature of their interaction. We intended to utilize the pre-made, closed-ended questions to measure how respondents felt about AI, CSP, and OI in relation to big data. The questions consisted of rating scales or multiple-choice items, both of which were straightforward to administer and evaluate. We were able to learn more about respondents' personal contacts with big data AI, CSP, and OI, as well as the role organizational innovation played in mediating the relationship between AI and CSP, by asking them open-ended questions.

We used statistical approaches such as Partial Least Squares-Structural Equation Modeling to evaluate the survey data (PLS-SEM). With this analysis, we were able to discover the most significant relationships between AI for big data, CSP, OI, and the mediating function of innovation within businesses. Three hundred respondents offered a statistically significant sample size and an authentic representation of the Asian enterprises under investigation, confirming the validity and dependability of the study. Both CSP and OI can gain considerably from the deployment of AI powered by big data, according to the research. In addition, it was discovered that organizational innovation mediates the connection between AI for big data and CSP. Using big data and AI to enhance CSP and OI is an enormous step forward, and the ramifications of these findings are significant for enterprises. This study utilized a survey approach to evaluate the relationship between big data AI, CSP, OI, and organizational innovation, their mediator

RESULTS

Sem-pls, a two-step procedure that elucidates data patterns and correlations, was used in the study's analysis to get insight. In order to guarantee the reliability of their results, the

researchers first constructed a robust measuring model. Following the first setup, they investigated the intricate web of connections inside the structural model. Their tenacity shed light on what needed to be done next.

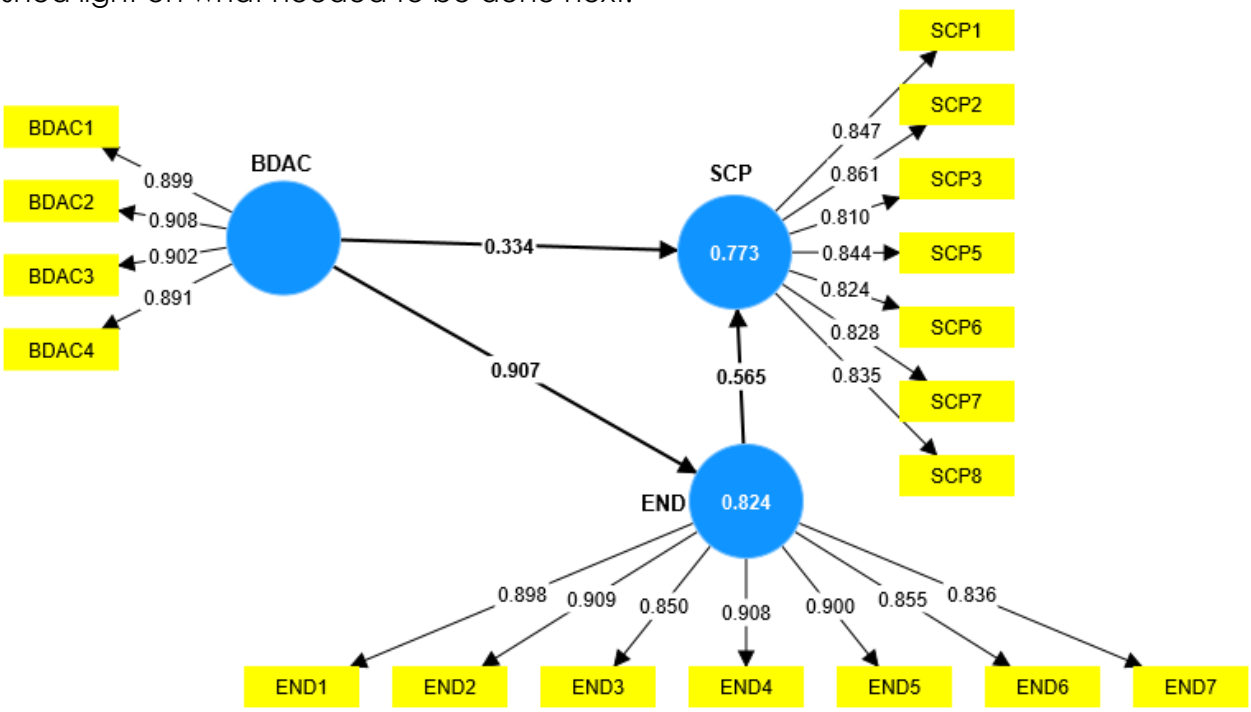

Figure 2.

Measurement Model

"Outer loadings" indicate latent-observable data processing linkages. Regression coefficients were used to develop a complex metricing model that graphically showed the deep relationships between their variables of interest. These outside loadings were added to the PLS-SEM model's structural equations to show how latent variables affect observable variables. They found that the amount of the outside loadings was a crucial signal, allowing them to focus on the model's most important predictions and better grasp the complex dynamics. By Table 1, they were confident they had found something truly remarkable.

Table 1.

Outer Loadings

	BDAC	END	SCP
BDAC1	0.899		
BDAC2	0.908		
BDAC3	0.902		
BDAC4	0.891		
END1		0.898	
END2		0.909	
END3		0.850	
END4		0.908	
END5		0.900	
END6		0.855	
END7		0.836	

SCP1	0.847
SCP2	0.861
SCP3	0.810
SCP5	0.844
SCP6	0.824
SCP7	0.828
SCP8	0.835

SEM with Partial Least Squares (PLS) requires reliability analysis to assess the measurement model's consistency and stability (Hair et al.,2021). PLS-measurement Latent-observable correlations affect SEM model quality and output. Correlation ratio and average variance explained assess PLS-SEM accuracy. A latent variable's mean squared factor loadings (CR) approaching 1 indicates good reliability (Shrestha,2021). AVE can accurately assess latent variable variation for closely observed variables.

Table 2.

Reliability Analysis

	Cronbach's alpha	(rho_a)	(rho_c)	(AVE)
BDAC	0.922	0.922	0.945	0.810
END	0.951	0.953	0.960	0.774
SCP	0.929	0.937	0.942	0.698

The following table shows this research's discriminant validity.

Table 3: Discriminant validity

	BDAC	END	SCP
BDAC	0.900		
END	0.907	0.880	
SCP	0.846	0.868	0.836

Discriminant Validity:

Researchers are able to go through the data and uncover relevant patterns with the assistance of discriminant validity. The data were analyzed using the rigorous method developed by Fornell and Larker, and the results led researchers to the conclusion that the variables in the study were unrelated to one another. The results shown in Table 3 demonstrated that all of the variables possessed a high level of discriminant validity. This was due to the fact that the bold loadings for the constructs had a larger value than those of the other variables. They eventually came around to accepting the results because they were founded on genuine and trustworthy data.

Structural Model:

We used the structural model to demonstrate the computed hypothesis's accuracy. Each variable has been found to represent a latent construct.

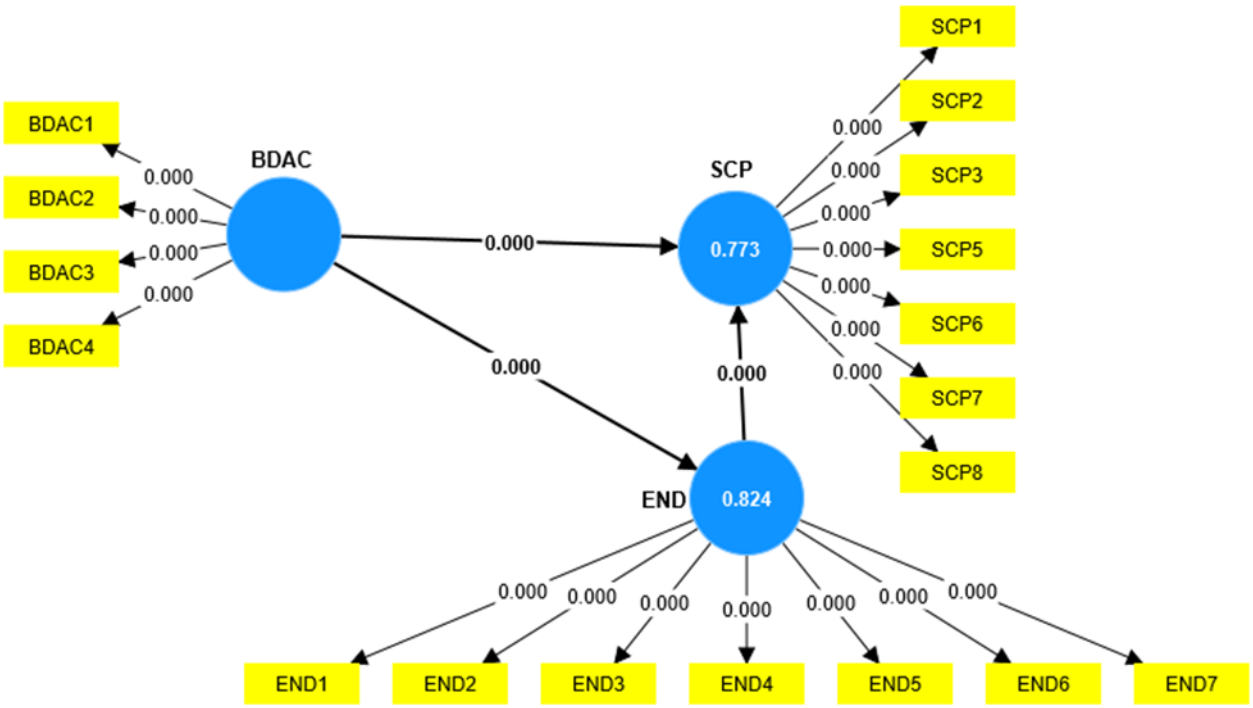

Figure 3.
Structural Model

The application of Structural Equation Modeling (SEM) with Partial Least Squares has changed the field of data analysis (PLS). This unique method combines a measurement model with a structural model to generate latent variable correlations that accurately reflect the data's underlying causal structure. Both of these "structural modeling" techniques are extremely powerful.

Table 4.
Direct Results

	(O)	(M)	(STDEV)	(|O/STDEV|)	P values
BDAC -> END	0.907	0.907	0.016	58.013	0.000
BDAC -> SCP	0.846	0.848	0.024	35.291	0.000
END -> SCP	0.565	0.565	0.082	6.917	0.000

Table 5 displays the statistically significant mediation inquiry path.

Table 5.
Mediation Analysis

	(O)	(M)	(STDEV)	(|O/STDEV|)	P values
BDAC -> END -> SCP	0.513	0.513	0.075	6.836	0.000

DISCUSSION AND CONCLUSION

This study's research strategy used a survey because it provided for the most comprehensive assessment of the relationship between big data AI, CSP, and organizational innovation (OI). The members of the sample were all professionals

employed by various sorts of Asian businesses. 300 questionnaires were issued; they had 265 questions meant to analyze the existence of big data AI, CSP, and OI in the respective enterprises. The survey's closed- and open-ended questions were designed to determine the prevalence of AI, CSP, and OI in big data, as well as the nature of their interaction. We intended to utilize the pre-made, closed-ended questions to measure how respondents felt about AI, CSP, and OI in relation to big data. The questions consisted of rating scales or multiple-choice items, both of which were straightforward to administer and evaluate. We were able to learn more about respondents' personal contacts with big data AI, CSP, and OI, as well as the role organizational innovation played in mediating the relationship between AI and CSP, by asking them open-ended questions.

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