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## The Role of Big Data Analytics in Enhancing Decision-Making Processes in Business Accounting

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**Abstract:** In the digital era, Big Data Analytics (BDA) has become an important tool in business decision-making, including in the fields of accounting and finance. The implementation of BDA allows companies to manage data at scale, improving efficiency, accuracy, and transparency in financial statements and audit processes. This study aims to analyze the role of BDA in improving the decision-making process in business accounting, identify its benefits in the efficiency and transparency of financial statements, and explore the key challenges companies face in adopting this technology. The method used in this study is quantitative with a survey approach, where data is collected from 22 respondents consisting of accountants, financial managers, CFOs, financial analysts, and IT/data engineers. The analysis techniques used included descriptive statistics and simple regression. The results show that the use of BDA has a significant influence on the quality of business accounting decision-making ( $\beta_1 = 0.76$ ,  $p = 0.000$ ), as well as contributing to improving the efficiency, accuracy, and transparency of financial statements and audits. The main challenges in BDA adoption include lack of HR skills (Mean = 3.5), implementation costs (Mean = 3.7), and system integration (Mean = 3.5). Therefore, companies need to implement HR training strategies, use cloud solutions, and develop API-based integration systems to overcome these obstacles.

**Keywords:** Big data analytics (BDA), accounting decision making, financial efficiency and transparency.



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## 大数据分析在增强商业会计决策过程中的作用

**摘要:** 在数字时代, 大数据分析 (BDA) 已成为企业决策的重要工具, 尤其是在会计和财务领域。BDA 的实施使企业能够大规模管理数据, 从而提高财务报表和审计流程的效率、准确性和透明度。本研究旨在分析 BDA 在改进企业会计决策流程中的作用, 明确其在提高财务报表效率和透明度方面的优势, 并探讨企业在采用该技术时面临的关键挑战。本研究采用定量问卷调查法, 数据收集自 22 位受访者, 包括会计师、财务经理、首席财务官、财务分析师以及 IT/数据工程师。所使用的分析技术包括描述性统计和简单回归。结果表明, BDA 的使用对企业会计决策质量具有显著影响 ( $\beta_1 = 0.76, p = 0.000$ ), 并有助于提高财务报表和审计的效率、准确性和透明度。BDA 应用的主要挑战包括人力资源技能不足 (平均值 = 3.5)、实施成本 (平均值 = 3.7) 以及系统集成 (平均值 = 3.5)。因此, 企业需要实施人力资源培训策略、使用云解决方案并开发基于 API 的集成系统来克服这些障碍。

**关键词:** 大数据分析、会计决策、财务效率和透明度。

### 1. Introduction

In the rapidly evolving digital era, Big Data Analytics technology has become one of the key elements in the decision-making process in various business sectors, including accounting. Big Data refers to the enormous volume of data generated by business transactions, social media, IoT sensors, and various other sources that must be processed and analyzed to generate useful insights [1]. In the field of business accounting, Big Data Analytics plays an important role in improving the efficiency of financial reporting, detecting anomalies in audits, and optimizing business strategies based on identified data patterns [2]. By leveraging advanced data analytics, companies can gain a competitive advantage and improve the accuracy of data-driven decision-making [3].

Big Data refers to a large set of data that is complex and constantly evolving, so it cannot be managed with conventional data processing methods. The main characteristics of Big Data are often summarized in five "V's", namely volume, velocity, variety, veracity, and value [1]. Volume refers to a very large amount of data, velocity relates to the speed of data production and processing, variety reflects a variety of data types (structured and unstructured), veracity emphasizes the accuracy and reliability of data, and value describes the value or benefits that can be obtained from the analysis of that data. In recent years, Big Data has become a crucial technology in various sectors, including business, healthcare, industry, and government. According to [4], the use of Big Data in intelligent manufacturing systems has resulted in higher efficiency in decision-making and production automation.

Big Data applications are constantly evolving, especially with the integration of artificial intelligence (AI), which is improving data analytics in various industries. In agriculture, the use of Big Data in precision agriculture has allowed farmers to monitor soil and crop conditions in real-time, thereby increasing agricultural productivity and efficiency [5]. In the health care sector, Big Data plays an important role in patient data analysis, disease diagnosis, and prediction-based health care optimization using AI algorithms [6]. In addition, in the financial industry, Big Data technology is used to detect suspicious financial activities through real-time transaction analysis, improve cybersecurity, and optimize customer behavior-based marketing strategies [7]. With its growing adoption, the main challenges in Big Data implementation include the need for large storage infrastructures, data privacy and security concerns, and the skills needed to manage and analyze data at scale [8]. However, the prospects for Big Data development are still very bright, especially with the advancement of cloud computing and AI technology, which is increasingly increasing the effectiveness of data management in various fields.

As the complexity of business transactions increases and the volume of data generated, traditional accounting methods are no longer sufficient to handle large amounts of information efficiently [9]. Big Data-based accounting allows companies to integrate various data sources to improve the accuracy of financial statements and accelerate decision-making [10]. In addition, the application of Big Data Analytics in accounting also contributes to faster and more accurate fraud detection through the analysis of suspicious transaction patterns

[11]. Thus, the implementation of this technology not only improves operational efficiency but also reduces financial risks that can harm the company.

Big Data technology also enables the automation of accounting processes, where various functions that were previously performed manually can now be executed with algorithms based on artificial intelligence and machine learning [12]. This provides significant benefits for companies in terms of increasing efficiency, reducing costs, and improving audit quality [13]. In other words, Big Data Analytics allows accountants to transform from mere transaction recorders to strategic analysts who provide data-driven insights for companies [14]. Therefore, understanding the role and implications of Big Data in business accounting is urgently needed for academics and business practitioners.

However, despite the great benefits, the adoption of Big Data Analytics in accounting still faces various challenges, including limited technological infrastructure, lack of human resource skills, and data security and privacy issues [15]. Many companies still have difficulty in integrating Big Data into their accounting systems due to the need for large investments in hardware, software, and workforce training [16]. Therefore, further research is needed to explore the best strategies for overcoming these challenges as well as optimizing the application of Big Data in the field of business accounting.

With the increasing number of complex business transactions and the globalization of the economy, companies need more advanced solutions in managing their financial information [17]. This research is expected to contribute to the academic literature as well as be a guide for practitioners in applying data analytics in a more efficient and transparent accounting process.

Several previous studies have discussed the benefits of Big Data in various aspects of business, including finance and accounting. For example, research by Hilton & Platt [18] shows that Big Data has contributed to improving the accuracy of cost estimation and strategic planning in businesses. Meanwhile, research conducted by Tiwari and Khan [19] discusses the role of analytics technology in sustainability accounting and how the integration of Big Data can support sustainability reporting in companies. Another study [20] highlighted how artificial intelligence and blockchain can be used alongside Big Data to improve efficiency and transparency in the accounting profession.

Big Data Analytics (BDA) plays an important role in accounting and finance, improving the efficiency and quality of decisions. However, there are still research gaps, such as the lack of empirical studies on the quantitative impact of BDA, its role in transparency and fraud detection, and its implementation challenges. This study fills the gap by analyzing the influence of BDA, exploring audit transparency, and identifying barriers and adoption strategies in business accounting.

This study offers a quantitative approach in analyzing the influence of Big Data Analytics (BDA) on the quality of accounting decisions, different from previous studies that are more conceptual. In addition to proving the significant impact of BDA, this study explores its role in audit transparency and fraud detection, as well as identifying its adoption challenges. With mitigation strategies and practical recommendations, this study contributes to academia and the business world.

This study aims to analyze the role of Big Data Analytics in improving the decision-making process in business accounting. This research explores how companies can leverage Big Data to improve efficiency, accuracy, and transparency in financial statements and audit processes. In addition, this research will also identify the main challenges in the adoption of Big Data in the field of accounting as well as the strategies that can be applied to overcome these obstacles. Thus, the results of this research are expected to provide valuable insights for academics, accounting practitioners, and other stakeholders in facing the increasingly complex digital era.

## 2. Method

This study uses a quantitative method with a descriptive statistical analysis approach to examine the role of Big Data Analytics in improving the decision-making process in business accounting [21]. This approach was chosen because it allows research to measure and analyze patterns of Big Data usage in corporate accounting systems as well as their impact on the efficiency and effectiveness of business decision-making. Thus, the results obtained can provide a more accurate empirical picture of the contribution of Big Data Analytics in the world of accounting.

The research will be conducted at PT XYZ Indonesia, a company in the manufacturing, financial services, or trading sectors that has adopted Big Data Analytics in its business accounting system. The selection of this company was based on the use of analytics technology in financial management, the scale of medium to large companies, and the availability of relevant data and respondents. If needed, research can be expanded to other sectors such as banking or fintech.

The study population consisted of employees in the accounting and finance divisions, including accountants, financial managers, CFOs, financial analysts/data scientists, and IT and data engineers involved in Big Data Analytics-based data processing. The number of people who meet this criterion is estimated to be 150.

The purposive sampling technique is used to ensure that only respondents who have experience in the use of Big Data Analytics in accounting are involved. The number of selected samples was 22 respondents, consisting of 10 accountants, 5 financial managers, 3 CFOs, 2 financial analysts/data scientists, and 2 IT/data

engineers. This sample is expected to provide in-depth insights into the role of Big Data Analytics in improving decision-making in business accounting at PT XYZ Indonesia.

The data collection technique in this study was carried out through the distribution of a questionnaire based on Likert scale 1-5, where respondents were asked to provide an assessment of the extent to which the application of Big Data Analytics contributes to the main aspects of the accounting process, such as improving the accuracy of financial statements, detecting anomalies in audits, optimizing business strategies, and operating efficiency of the company. In addition, in-depth interviews were also conducted with several accounting experts and practitioners as well as data analysts to get a more in-depth perspective on the challenges and opportunities in the adoption of Big Data in the field of business accounting.

The data analysis method in this study uses descriptive statistical techniques, where the survey

results are analyzed to describe trend patterns and relationships between research variables. The collected data will be processed using statistical software such as SPSS or STATA to calculate the mean, median, standard deviation, and frequency distribution of each variable studied. In addition, a simple linear correlation and regression test was carried out to evaluate the extent to which the application of Big Data Analytics affects the effectiveness of accounting decision-making in the company.

### 3. Results

The adoption of Big Data Analytics (BDA) in organizations shows a fairly high adoption rate, with an average score of 3.9 and a median of 4.0, indicating that most companies have adopted this technology, although some are still in the early stages of implementation (Table 1).

**Table 1. Use of Big Data Analytics in accounting and finance (compiled by the authors)**

Statement	Mean	Median	Modus	Std. Deviation
Organizations have adopted the BDA	3.9	4.0	4	0.58
BDA improves accounting efficiency	4.0	4.1	4	0.55
Data from the BDA is more accurate	3.9	4.0	4	0.56
BDA allows the identification of patterns and trends	4.1	4.2	4	0.52

The variation in adoption rates was relatively small, as indicated by a standard deviation of 0.58. The use of BDA has been shown to provide significant benefits in accounting efficiency, with an average score of 4.0, indicating that the majority of respondents agree or strongly agree that this technology speeds up as well as improves the accuracy of accounting processes, with a fairly consistent perception among them (standard deviation of 0.55). In addition, BDA also contributed to

an increase in data accuracy with an average score of 3.9, although there was still a small percentage of respondents who were not fully sure, as indicated by the median and mode of 4. Furthermore, BDA allows for better identification of patterns and trends in accounting and financial data, with an average value of 4.1, indicating that the technology provides deeper insights and aids in more effective strategic decision-making (Table 2).

**Table 2. Influence of Big Data Analytics on the quality of decision-making (compiled by the authors)**

Statement	Mean	Median	Modus	Std. Deviation
BDA improves the quality of decisions	4.3	4.3	4	0.45
BDA-based decisions are more effective	4.1	4.2	4	0.50
BDA accelerates financial decisions	4.2	4.2	4	0.47
Organizations are more confident with BDA-based decisions	4.0	4.1	4	0.53

Big Data Analytics (BDA) has been proven to have a significant positive impact on the quality of financial decisions, with an average score of 4.3, which shows that the majority of respondents feel an increase in accuracy and precision in decision-making. This perception was relatively uniform among respondents, as indicated by the low standard deviation (0.45). In addition, BDA was also considered effective in reducing financial risk, with an average score of 4.1, where most respondents believed that this technology helped better manage and mitigate risks. In terms of the speed of decision-making, BDA showed a significant role with an average score of 4.2, as well as a median and mode of 4,

indicating that almost all respondents admitted that the use of this technology accelerates the business decision-making process. Furthermore, organizations that use BDA tend to be more confident in making data-driven decisions, with an average score of 4.0. However, a standard deviation of 0.53 indicates a variation in this level of confidence, possibly due to differences in the understanding and readiness of each organization in managing and using big data optimally.

Big Data Analytics (BDA) has proven to be instrumental in improving financial accuracy and predictability, as reflected in all statements in this category that have an average score above 4.0 (Table 3).

**Table 3. Impact of BDA on Accuracy and Predictability (compiled by the authors)**

Statement	Mean	Median	Modus	Std. Deviation
BDA improves the accuracy of financial predictions	4.2	4.3	4	0.47
BDA reduces recording errors	4.2	4.3	4	0.49
BDA allows for more accurate trend projections	4.3	4.4	4	0.45
BDA helps detect financial anomalies	4.1	4.2	4	0.50

With a mean value of 4.2, BDA is considered to be able to improve the accuracy of financial predictions and reduce recording errors, while its ability to enable more accurate trend projections has the highest average score, which is 4.3. In addition, BDA also played a role in detecting financial anomalies with a mean value of 4.1, indicating that most respondents realized its benefits in identifying discrepancies in financial data. The consistency of perception of BDA effectiveness in this aspect can be seen from the relatively low standard deviation, ranging from 0.45 to 0.50, which indicates that respondents' responses tended to be uniform across different groups. This shows that BDA is not only widely accepted but is also considered a reliable tool in improving financial accuracy and data-driven decision-making.

#### Simple Regression Analysis:

$$Y = \beta_0 + \beta_1 X + e$$

where:

**Y** = quality of decision-making (average score of statements 8-11)

**X** = use of Big Data Analytics (average score of statements 4-7)

$\beta_0$  = Constant (intercept)

$\beta_1$  = Regression coefficients that show the effect of the use of BDA on the quality of decisions (Table 4)

$e$  = Error

**Table 4. Regression coefficients (compiled by the authors)**

Variable	B (Coefficient)	Std. Error	t	Sig. (p-value)
Constant ( $\beta_0$ )	1.10	0.23	4.78	0.000**
Uses of BDA ( $\beta_1$ )	0.76	0.12	6.33	0.000**

The results of the analysis showed a strong correlation between the use of Big Data Analytics (BDA) and the quality of decisions, with an R value of 0.82 (Table 5).

**Table 5. Model Summary (compiled by the authors)**

Model	R	R Square	Adjusted R Square	Std. Error
1	0.82	0.67	0.66	0.28

An R-square value of 0.67 indicates that 67% of the variation in decision quality can be explained by the use of BDA, while an adjusted R-square of 0.66 indicates

that after being corrected for the number of variables, the model remains robust and stable. In addition, an error standard of 0.28 reflects a relatively small prediction error rate, indicating that the model has good accuracy in explaining the relationship between BDA and decision quality.

The following regression equation was obtained:

$$Y = 1.10 + 0.76X$$

The results of the regression analysis show that the use of Big Data Analytics (BDA) has a significant and positive influence on the quality of decision-making, with a regression coefficient ( $\beta_1$ ) of 0.76. This means that every one-point increase in the use of BDA will improve the quality of decisions by 0.76 points. This influence was also shown to be statistically significant with a p-value of 0.000, which was below the threshold of 0.05. In addition, the model constant ( $\beta_0$ ) of 1.10 indicates that even if the organization does not use BDA at all, the quality of decisions still has a base value of 1.10, indicating that there are other factors that contribute to the decision-making process. In terms of model strength, an  $R^2$  value of 0.67 indicates that 67% of the variation in decision quality can be explained by the use of BDA, while the remaining 33% is influenced by other factors, such as human resource skills, organizational policies, or other technological factors. Overall, these findings confirm that the higher the rate of adoption and use of BDA, the better the quality of decisions taken by organizations. Therefore, it is recommended that organizations increase their investment in BDA technology and strengthen human resource training in data management and analysis to maximize the benefits obtained from BDA implementation.

## 4. Discussion

Based on the results of the analysis that has been carried out, this study successfully answers the main objectives proposed at the beginning. Big Data Analytics (BDA) has proven to have a significant role in improving the decision-making process in business accounting, as well as assisting companies in improving efficiency, accuracy, and transparency in financial statements and audit processes. In addition, the study also identifies various challenges faced in the adoption of BDA and the strategies that can be applied to overcome them.

#### 4.1. The Role of Big Data Analytics in Improving the Decision-Making Process in Business Accounting

The findings in this study show that the use of Big Data Analytics has a significant influence on the quality of financial decision-making. The regression results obtained indicate that the higher the use of BDA in an organization, the higher the quality of financial decisions taken, with a regression coefficient of 0.76 ( $p = 0.000$ ). In addition, the descriptive analysis showed that most respondents agreed that BDA improved accuracy and efficiency in decision-making, with an average score of 4.3 on the quality aspect of the decision and 4.2 on the speed of decision-making.

This is in line with the concept of the Decision Usefulness Theory put forward by Beaver [22], stating that accurate, relevant, and timely information is a key factor in improving financial decision-making.

In the context of Big Data, as stated in [23], organizations that adopt a data-driven approach in decision-making perform better than organizations that still rely on intuition or conventional methods. The results of this study support their findings, where most respondents (Mean = 4.3) stated that the use of BDA improves the accuracy and effectiveness of financial decision-making.

In addition, the Information Processing Theory developed by Galbraith [24] explains that higher information processing capacity will improve the organization's ability to manage uncertainty in decision-making. BDA allows organizations to access and analyze data at scale in real-time, making decisions more evidence-driven (data-driven). This is reflected in the regression results of this study, where the use of BDA had a significant effect on the quality of decisions with a regression coefficient of 0.76 ( $p = 0.000$ ).

#### 4.2. Use of Big Data to Improve Efficiency, Accuracy, and Transparency in Financial Statements and Audit Processes

In addition to improving the quality of decision-making, the study also found that Big Data Analytics contributes to improving efficiency, accuracy, and transparency in financial statements and audit processes. In terms of efficiency, most respondents agreed that BDA helps speed up the accounting and financial reporting process, with an average score of 4.0. This means that companies that adopt BDA can reduce manual work in financial recording and reporting, which ultimately increases the productivity of the finance team.

In addition, the accuracy of financial statements has also increased with the existence of BDA, with an average score of 3.9. This shows that the use of BDA can reduce the possibility of recording errors and increase the reliability of financial data generated by companies. With automated data analysis, companies can avoid human bias in recording transactions and improve the quality of information reported to management and

other stakeholders.

These findings are comply with the concept of the resource-based view (RBV) [25], which states that technology-based resources, such as BDA, can provide a competitive advantage for companies.

In particular, the Efficient Market Hypothesis (EMH) theory put forward by [26] argues that information available in real-time allows the market to work more efficiently. In the context of accounting, BDA allows companies to reduce asymmetric information and improve the transparency of financial statements, as evidenced in this study with an average score of 4.1 on audit transparency and financial anomaly detection.

In terms of efficiency, as found in [27], BDA can reduce time and cost in accounting and auditing data processing. This agrees with the findings of this study, where BDA improved financial reporting efficiency with an average score of 4.0. With the use of automation and machine learning, many accounting tasks that were previously performed manually can now be accelerated with the help of data algorithms.

In addition, in the audit aspect, the Fraud Triangle Theory [28] explains that fraud in financial statements occurs due to pressure, opportunity, and rationalization. BDA helps address this issue by providing a data-driven fraud detection system that allows auditors to detect suspicious transactions and financial anomalies more quickly. The findings of this study support this theory, where respondents agree that BDA plays a role in improving the detection of financial anomalies and potential fraud (Mean = 4.1).

#### 4.3. Key Challenges in Big Data Adoption in Accounting and Strategies to Address Them

The findings in this study show that the lack of HR skills, implementation costs, and integration challenges with legacy systems are the main obstacles in the adoption of BDA. This complies with the Technology-Organization-Environment (TOE) Framework theory [29], which explains that the adoption of technology in an organization is influenced by technology, organization, and environmental factors.

One of the main challenges identified in this study is the lack of HR skills in data analysis, with an average score of 3.5 and a standard deviation of 0.63. This shows that many accounting and finance professionals do not yet have adequate skills in processing and analyzing data on a large scale. This supports the findings of [30], stating that one of the main obstacles in digital transformation is the lack of a workforce that has adequate data analysis skills.

To address these challenges, companies need to provide intensive training and skill development programs for accountants and finance professionals so that they can better understand and apply BDA technology in their work. In addition, companies can also build collaboration between the finance team and

the data science team, so that the use of data in decision-making can be carried out more effectively.

In addition to HR skills, implementation costs are also a major obstacle in BDA adoption, with an average score of 3.7. This high cost is especially a challenge for small- and medium-sized companies that do not have adequate technological infrastructure. This agrees with the research by Brynjolfsson & Hitt [23], which found that the adoption of new technologies often faces challenges in terms of large initial investment costs. One strategy that can be implemented to overcome this obstacle is to leverage cloud-based technology, which allows companies to use BDA systems without having to make large investments in IT infrastructure. Additionally, companies can also use open-source solutions, such as Hadoop and Apache Spark, to manage data at scale at a lower cost.

Another challenge found in this study is the difficulty in integrating BDA with traditional accounting systems, with an average score of 3.5. This is due to the difference in the system architecture between the BDA platform, which is based on advanced analytics, and the old financial system, which still uses conventional technology. To overcome this obstacle, companies can develop APIs and middleware that allow for easier integration between legacy systems and BDA-based systems. In addition, working with a technology vendor that has experience in data migration can also be a solution to reduce the barriers in the integration process.

The representation of gender inequality in this text has indeed emerged through the experiences of the main character, who faces structural pressures in the domestic space. However, this depiction is still implicit and has not fully revealed the power relations that perpetuate gender inequality both historically and systemically. To deepen this analysis, a theoretical approach from feminism—especially intersectional feminism—is used as a basis for strengthening the narrative and critical reflection.

Through the lens of intersectionality as formulated by Kimberlé Crenshaw [31], gender inequality cannot be understood as a single entity, but rather as the result of the intersection of social identities such as class, ethnicity, and position in the family structure. In this text, the female character presented faces double pressures, both as an individual in a patriarchal system and as part of a marginal social class. This situation places her in a vulnerable condition, where her life choices, social relations, and control over her body are determined by normative values formed by male dominance.

The family structure present in the narrative is a concrete example of how patriarchy works in everyday life. In line with the theoretical framework of patriarchy put forward by Sylvia Walby [32], the family institution becomes the main arena for the reproduction of male power, where masculine authority is prioritized and

women's voices tend to be suppressed. The silence of the adult women in the story is not a form of ignorance, but rather a reflection of the long internalization of traditional roles that have been imposed and naturalized.

Furthermore, the tension experienced by the female characters does not only appear in the form of verbal or psychological conflicts, but is also manifested in physical wounds that symbolically reflect the repression of women's bodies. In this case, the bell hooks' perspective on violence against women as a mechanism for perpetuating patriarchal power becomes relevant. Women's bodies are no longer interpreted as autonomous entities but as sites of domination and social control.

Strengthening this narrative can be done by adding reflective elements and critical awareness of the characters toward the injustices faced. Through inner monologues or introspective narratives, the text can show that these personal experiences do not stand alone, but are part of a broader and more layered social structure.

## 5. Conclusion

Based on the results of the research, it can be concluded that Big Data Analytics (BDA) plays an important role in improving the decision-making process in business accounting. Regression analysis shows that the use of BDA has a significant effect on the quality of financial decisions, where the higher the use of BDA, the higher the quality of decision-making carried out by the organization. In addition, BDA has been proven to improve efficiency in financial reporting, reduce recording errors, and speed up the audit process by detecting financial anomalies faster.

However, despite the obvious benefits, BDA adoption still faces various challenges, especially in terms of the lack of HR skills in data analysis, high implementation costs, and difficulties in integrating BDA systems with traditional financial systems. Therefore, in order for the implementation of BDA to run optimally, companies need to develop the right strategy to overcome these challenges.

The implications of this study include both theoretical and practical aspects. From a theoretical perspective, this study contributes to the accounting and technology literature by providing a quantitative approach in analyzing the impact of BDA on business decision-making. The results of this study support the Decision Usefulness Theory, which states that accurate and relevant information is critical in improving the quality of financial decision-making. From a practical point of view, this study provides insights for companies, auditors, and accountants on how BDA can be applied to improve financial efficiency and transparency. In addition, this study also provides guidance for companies in overcoming obstacles to BDA implementation so that they can optimize the

benefits of this technology in their financial system.

To optimize the application of Big Data Analytics (BDA) in business accounting, companies need to focus on training HR so that accountants and financial teams have data analysis skills and increase collaboration with data scientists. The use of cloud technology and open-source software such as Hadoop and Apache Spark can overcome cost constraints. BDA's integration with the financial system can be strengthened through APIs and middleware without replacing existing systems. In addition, data security must be enhanced with encryption and real-time monitoring to protect sensitive information. With this strategy, companies can increase their efficiency and transparency in accounting and auditing.

This study has several limitations that should be acknowledged. First, the sample size was relatively small (n=22) and limited to a single case study at PT XYZ Indonesia, which may affect the generalizability of the findings across different industries and organizational contexts. Second, the use of a purely quantitative approach, while effective in measuring statistical relationships, may not fully capture the nuanced experiences and contextual challenges of Big Data Analytics (BDA) implementation in accounting. Third, the study relies on self-reported data, which may introduce response bias. Lastly, technological readiness and organizational culture were not thoroughly examined although these factors significantly influence BDA adoption outcomes. Future research should consider larger, multi-sector samples and employ mixed-method approaches to enrich and validate the insights obtained.

For further research, there are several aspects that can be explored further. One of them is to expand the number and variety of respondents so that the results of the research are more generalized in various industries. In addition, a mixed-method approach that combines quantitative analysis and interviews with experts can provide a deeper understanding of the challenges and strategies of BDA implementation. Other factors such as regulatory compliance, organizational culture, and technological readiness can also be studied as variables influencing BDA adoption. Comparative studies between industries can also be conducted to determine how the application of BDA differs in the manufacturing, financial services, and public sector sectors. With further research, an understanding of the role and challenges of BDA in business accounting can be further developed, supporting more accurate, efficient, and transparent financial decision-making.

## Declarations

### Author Contributions

Conceptualization, S.P., and G.I.S.; methodology, S.P., and M.H.; software, L.J., and J.B; validation, S.P.

and G.I.S.; formal analysis, L.J.; investigation, S.P., and M.H.; resources, S.P.; data curation, S.P.; writing—original draft preparation, all authors contributed equally; writing—review and editing, S.P.; visualization, L.J., and J.B; supervision, S.P.; project administration, S.P. All authors have read and agreed to the published version of the manuscript.

### Data Availability Statement

The data presented in this study are available on request from the corresponding author.

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Funding information is not available.

### Institutional Review Board Statement

The study was conducted in accordance with the Declaration of Helsinki and was approved by the Review Committee of Research Center of the Universitas Musamus, Merauke, Indonesia.

### Informed Consent Statement

Informed consent was obtained from all the subjects involved in the study.

### Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this manuscript.

## References

- [1] AJAH IA, and NWEKE HF. Big data and business analytics: Trends, platforms, success factors and applications. *Big data and Cognitive Computing*, 2019, 3(2): 32. <https://doi.org/10.3390/bdcc3020032>
- [2] HATAMLAH H, ALLAHHAM M, ABU-ALSONDOS IA, AL-JUNAIDI A, AL-ANATI GM, and AL-SHAIKH M. The role of business intelligence adoption as a mediator of big data analytics in the management of outsourced reverse supply chain operations. *Applied Mathematics and Information Sciences*, 2023, 17( 5): 897–903. <https://dx.doi.org/10.18576/amis/170516>
- [3] OYEWU B, OBANOR A, and IWUANYANWU C. Determinants of the adoption of big data analytics in business consulting service: a survey of multinational and indigenous consulting firms. *Transnational Corporations Journal*, 2023, 15(2): 1–20. <https://doi.org/10.1080/19186444.2022.2044737>
- [4] WANG J, XU C, ZHANG J, and ZHONG R. Big data analytics for intelligent manufacturing systems: A review. *Journal of Manufacturing Systems*, 2022, 62: 738–752. <https://doi.org/10.1016/j.jmsy.2021.03.005>
- [5] BHAT SA, and HUANG N-F. Big data and AI revolution in precision agriculture: Survey and challenges. *IEEE Access*, 2021, 9: 110209–110222. <https://doi.org/10.1109/ACCESS.2021.3102227>
- [6] KARATAS M, ERISKIN L, DEVECI M, PAMUCAR D, and GARG H. Big Data for Healthcare Industry 4.0: Applications, challenges and future perspectives. *Expert Systems with Applications*, 2022, 200: 116912. <https://doi.org/10.1016/j.eswa.2022.116912>

- [7] DUAN Y, EDWARDS JS, and DWIVEDI YK. Artificial intelligence for decision making in the era of Big Data—evolution, challenges and research agenda. *International Journal of Information Management*, 2019, 48: 63–71. <https://doi.org/10.1016/j.ijinfomgt.2019.01.021>
- [8] JAGATHEESAPERUMAL SK, RAHOUTI M, AHMAD K, AL-FUQAHA A, and GUIZANI M. The duo of artificial intelligence and big data for industry 4.0: Applications, techniques, challenges, and future research directions. *IEEE Internet Things Journal*, 2021, 9(15): 12861–12885. <https://doi.org/10.1109/JIOT.2021.3139827>
- [9] GULIN D, HLADIKA M, and VALENTA I. Digitalization and the Challenges for the Accounting Profession. *ENTRENOVA Conference Proceedings*, 2019, 5(1): 428–437. <https://dx.doi.org/10.2139/ssrn.3492237>
- [10] HAMILTON RH, and SODEMAN WA. The questions we ask: Opportunities and challenges for using big data analytics to strategically manage human capital resources. *Business Horizons*, 2020, 63(1): 85–95. <https://doi.org/10.1016/j.bushor.2019.10.001>
- [11] MOLL J, and YIGITBASIOGLU O. The role of internet-related technologies in shaping the work of accountants: New directions for accounting research. *British Accounting Review*, 2019, 51(6): 100833. <https://doi.org/10.1016/j.bar.2019.04.002>
- [12] QASIM A, and KHARBAT FF. Blockchain technology, business data analytics, and artificial intelligence: Use in the accounting profession and ideas for inclusion into the accounting curriculum. *Journal of Emerging Technologies in Accounting*, 2020, 17(1): 107–117. <https://doi.org/10.2308/jeta-52649>
- [13] SALIJENI G, SAMSONOVA-TADDEI A, and TURLEY S. Big Data and changes in audit technology: contemplating a research agenda. *Accounting and Business Research*, 2019, 49(1): 95–119. <https://doi.org/10.1080/00014788.2018.1459458>
- [14] HASAN AR. Artificial Intelligence (AI) in accounting & auditing: A Literature review. *Open Journal of Business and Management*, 2021, 10(1): 440–465. <https://doi.org/10.4236/ojbm.2022.101026>
- [15] DAGILIENĖ L. and KLOVIENĖ L. Motivation to use big data and big data analytics in external auditing. *Managerial Auditing Journal*, 2019, 34(7): 750–782. <https://doi.org/10.1108/MAJ-01-2018-1773>
- [16] MÖLLER K, SCHÄFFER U, and VERBEETEN F. Digitalization in management accounting and control: an editorial. *Journal of Management Control*, 2020, 31(1): 1–8. <https://doi.org/10.1007/s00187-020-00300-5>
- [17] KHANRA S, DHIR A, and MÄNTYMÄKI M. Big data analytics and enterprises: a bibliometric synthesis of the literature. *Enterprise Information Systems*, 2020, 14(6): 737–768. <https://doi.org/10.1080/17517575.2020.1734241>
- [18] HILTON RW, and PLATT DE. *Managerial accounting: creating value in a dynamic business environment*. McGraw-Hill, 2020.
- [19] TIWARI K, and KHAN MS. Sustainability accounting and reporting in the industry 4.0. *Journal of Cleaner Production*, 2020, 258: 120783.
- [20] ZHANG Y, XIONG F, XIE Y, FAN X, and GU H. The impact of artificial intelligence and blockchain on the accounting profession. *IEEE Access*, 2020, 8: 110461–110477. <https://doi.org/10.1109/ACCESS.2020.3000505>
- [21] SUGIYONO. *Metode Penelitian Kuantitatif, Kualitatif, R&D*. Bandung: IKAPI, 2016.
- [22] BEAVER WH. *Financial reporting: an accounting revolution*, 3<sup>rd</sup> ed. Prentice Hall, 1998.
- [23] MCAFEE A, BRYNJOLFSSON E, DAVENPORT TH, PATIL DJ, and BARTON D. Big data: the management revolution. *Harvard Business Review*, 2012, 90(10): 60–68. [https://ailab-ua.github.io/courses/MIS510/big\\_data\\_-\\_the\\_management\\_revolution\\_0.pdf](https://ailab-ua.github.io/courses/MIS510/big_data_-_the_management_revolution_0.pdf)
- [24] GALBRAITH JR. Organization design: An information processing view. *Interfaces (Providence)*, 1974, 4(3): 28–36. <https://doi.org/10.1287/inte.4.3.28>
- [25] BARNEY JB. Firm resources and sustained competitive advantage. In *Economics Meets Sociology in Strategic Management* (pp. 203-227). Emerald Group Publishing Limited, 2000. [https://doi.org/10.1016/S0742-3322\(00\)17018-4](https://doi.org/10.1016/S0742-3322(00)17018-4).
- [26] FAMA EF. Efficient capital markets. *Journal of Finance*, 1991, 46(5): 1575–1617. <https://doi.org/10.1111/j.1540-6261.1991.tb04636.x>
- [27] DAVENPORT TH, and DYCHÉ J. Big data in big companies. International Institute for Analytics, 2013, 1–31. <https://www.iqpc.com/media/7863/11710.pdf>
- [28] CRESSEY DR. *Other people's money; a study of the social psychology of embezzlement*. Wadsworth Publishing Company, 1971.
- [29] TORNATZKY LG, FLEISCHER M, and CHAKRABARTI AK. *The processes of technological innovation*. Lexington Books, 1990.
- [30] BUGHIN J, SEONG J, MANYIKA J, CHUI M, and JOSHI R. Notes from the AI frontier: Modeling the impact of AI on the world economy. Discussion Paper, McKinsey Global Institute, 2018. <https://www.mckinsey.com/~media/mckinsey/featured%20insights/artificial%20intelligence/notes%20from%20the%20frontier%20modeling%20the%20impact%20of%20ai%20on%20the%20world%20economy/mgi-notes-from-the-ai-frontier-modeling-the-impact-of-ai-on-the-world-economy-september-2018.ashx>
- [31] CRENSHAW KW. *On Intersectionality: Essential Writings*. Faculty Books, 2017, 255. <https://scholarship.law.columbia.edu/books/255>
- [32] WALBY S. *Theorizing Patriarchy*. John Wiley and Sons, 1991.

## 参考文献:

- [1] AJAH IA 和 NWEKE HF. 大数据与商业分析: 趋势、平台、成功因素和应用。《大数据与认知计算》, 2019, 3(2): 32. <https://doi.org/10.3390/bdcc3020032>
- [2] HATAMLAH H, ALLAHHAM M, ABU-ALSONDOS IA, AL-JUNAIDI A, AL-ANATI GM 和 AL-SHAIKH M. 商业智能应用作为大数据分析在外包逆向供应链管理中的中介作用。《应用数学与信息科学》, 2023, 17(5): 897–903. <https://dx.doi.org/10.18576/amis/170516>
- [3] OYEWO B, OBANOR A 和 IWUANYANWU C. 商业咨询服务中大数据分析应用的决定因素: 跨国和本土咨

- 询公司调查。《跨国公司杂志》，2023，15(2): 1-20。  
<https://doi.org/10.1080/19186444.2022.2044737>
- [4] WANG J、XU C、ZHANG J 和 ZHONG R. 智能制造系统的大数据分析: 综述。《制造系统杂志》，2022，62: 738-752。<https://doi.org/10.1016/j.jmsy.2021.03.005>
- [5] BHAT SA 和 HUANG N-F. 精准农业中的大数据与人工智能革命: 综述与挑战。IEEE 访问，2021，9: 110209-110222。<https://doi.org/10.1109/ACCESS.2021.3102227>
- [6] KARATAS M、ERISKIN L、DEVECI M、PAMUCAR D 和 GARG H. 面向医疗健康行业 4.0 的大数据: 应用、挑战和未来展望。专家系统及其应用，2022，200: 116912。  
<https://doi.org/10.1016/j.eswa.2022.116912>
- [7] DUAN Y、EDWARDS JS 和 DWIVEDI YK. 大数据时代决策的人工智能——演变、挑战和研究议程。国际信息管理杂志，2019，48: 63-71。  
<https://doi.org/10.1016/j.ijinfomgt.2019.01.021>
- [8] JAGATHEESAPERUMAL SK、RAHOUTI M、AHMAD K、AL-FUQAHA A 和 GUIZANI M. 人工智能与大数据在工业 4.0 中的结合: 应用、技术、挑战和未来研究方向。IEEE 物联网杂志，2021，9(15): 12861-12885。<https://doi.org/10.1109/JIOT.2021.3139827>
- [9] GULIN D、HLADIKA M 和 VALENTA I. 数字化与会计职业面临的挑战。ENTRENOVA 会议论文集，2019，5(1): 428-437。<https://dx.doi.org/10.2139/ssrn.3492237>
- [10] HAMILTON RH 和 SODEMAN WA. 我们提出的问题: 利用大数据分析战略性地管理人力资本资源的机遇与挑战。《商业视野》，2020，63(1): 85-95。  
<https://doi.org/10.1016/j.bushor.2019.10.001>
- [11] MOLL J 和 YIGITBASIOGLU O. 互联网相关技术在塑造会计工作中的作用: 会计研究的新方向。《英国会计评论》，2019，51(6): 100833。  
<https://doi.org/10.1016/j.bar.2019.04.002>
- [12] QASIM A 和 KHARBAT FF. 区块链技术、商业数据分析和人工智能: 在会计行业的应用以及纳入会计课程的想法。《新兴会计技术杂志》，2020，17(1): 107-117。<https://doi.org/10.2308/jeta-52649>
- [13] SALIJENI G、SAMSONOVA-TADDEI A 和 TURLEY S. 大数据与审计技术变革: 研究议程思考。《会计与商业研究》，2019，49(1): 95-119。  
<https://doi.org/10.1080/00014788.2018.1459458>
- [14] HASAN AR. 会计与审计中的人工智能 (AI): 文献综述。《开放商业与管理杂志》，2021，10(1): 440-465。  
<https://doi.org/10.4236/ojbm.2022.101026>
- [15] DAGILIENĖ L. 和 KLOVIENĖ L. 在外部审计中使用大数据和大数据分析的动机。《管理审计杂志》，2019 年，34(7): 750-782。<https://doi.org/10.1108/MAJ-01-2018-1773>
- [16] MÖLLER K、SCHÄFFER U 和 VERBEETEN F. 管理会计和控制中的数字化: 社论。《管理控制杂志》，2020，31(1): 1-8。<https://doi.org/10.1007/s00187-020-00300-5>
- [17] KHANRA S、DHIR A 和 MÄNTYMÄKI M. 大数据分析与企业: 文献计量综合。企业信息系统，2020，14(6): 737-768。<https://doi.org/10.1080/17517575.2020.1734241>
- [18] HILTON RW 和 PLATT DE. 管理会计: 在动态商业环境中创造价值。麦格劳-希尔，2020。
- [19] TIWARI K 和 KHAN MS. 工业 4.0 中的可持续性会计与报告。清洁生产杂志，2020，258: 120783。
- [20] 张燕、熊锋、谢勇、范晓燕和顾红. 人工智能和区块链对会计职业的影响。IEEE 访问，2020，8: 110461-110477。<https://doi.org/10.1109/ACCESS.2020.3000505>
- [21] SUGIYONO. 《财务报告方法: 会计革命》，《质量与研发》。万隆: IKAPI，2016。
- [22] BEAVER WH. 《财务报告: 一场会计革命》，第 3 版。普伦蒂斯·霍尔，1998。
- [23] MCAFEE A、BRYNJOLFSSON E、DAVENPORT TH、PATIL DJ 和 BARTON D. 《大数据: 管理革命》。《哈佛商业评论》，2012，90(10): 60-68。[https://ailab-ua.github.io/courses/MIS510/big\\_data\\_-\\_the\\_management\\_revolution\\_0.pdf](https://ailab-ua.github.io/courses/MIS510/big_data_-_the_management_revolution_0.pdf)
- [24] GALBRAITH JR. 组织设计: 信息处理视角。接口 (普罗维登斯)，1974，4(3): 28-36。  
<https://doi.org/10.1287/inte.4.3.28>
- [25] BARNEY JB. 企业资源与持续竞争优势。载于《战略管理中的经济学与社会学交汇》(第203-227页)。翡翠集团出版有限公司，2000。  
[https://doi.org/10.1016/S0742-3322\(00\)17018-4](https://doi.org/10.1016/S0742-3322(00)17018-4)
- [26] FAMA EF. 有效的资本市场。《金融杂志》，1991，46(5): 1575-1617。<https://doi.org/10.1111/j.1540-6261.1991.tb04636.x>
- [27] DAVENPORT TH 和 DYCHÉ J. 大公司中的大数据。国际分析研究所，2013，1-31。  
<https://www.iqpc.com/media/7863/11710.pdf>
- [28] CRESSEY DR. 他人的钱财: 一项关于挪用公款社会心理学的研究。沃兹沃思出版公司，1971。
- [29] TORNATZKY LG、FLEISCHER M 和 CHAKRABARTI AK. 技术创新过程。列克星敦图书，

1990。

[30] BUGHIN J、SEONG J、MANYIKA J、CHUI M 和 JOSHI R。《人工智能前沿笔记：人工智能对世界经济影响的建模》。讨论文件，麦肯锡全球研究院，2018。

<https://www.mckinsey.com/~media/mckinsey/featured%20insights/artificial%20intelligence/notes%20from%20the%20frontier%20modeling%20the%20impact%20of%20ai%20on%20the%20world%20economy/mgi-notes-from-the-ai-frontier-modeling-the-impact-of-ai-on-the-world-economy-september-2018.ashx>

[31] CRENSHAW KW。《论交叉性：基本著作》。教师书籍，2017，255。

<https://scholarship.law.columbia.edu/books/255>

[32] WALBY S。《父权制理论》。约翰·威利父子公司，1991。

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