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Testing the Effect of Big Data Analytics, Cybersecurity Measures, and User Training on Accounting Information System Performance in Start-up Companies in Indonesia

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ABSTRACT

Through quantitative research, this study examines the relationship between Big Data Analytics (BDA), Cybersecurity Measures (CSM), User Training (UT), and Accounting Information System (AIS) Performance in Indonesian start-up organizations. Demographic information was gathered from a sample of 135 individuals from a range of business sectors, and data were analyzed using partial least squares (SEM-PLS) and structural equation modeling. The structural model demonstrated a strong positive association between BDA, CSM, UT, and AIS Performance, whereas the measurement model demonstrated excellent validity and reliability. The model's explanatory and predictive capacity was validated by the R2 and Q2 values, and the model fit index showed an adequate fit. The results have applications for enhancing AIS efficacy in the dynamic environment of Indonesian startups

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1. INTRODUCTION

The integration of technology into accounting practices has become essential for organizations aiming to gain a competitive advantage. The Accounting Information System (SIA) serves as a backbone, simplifying financial processes, ensuring accurate reporting, and assisting in decision-making [1]–[3]. The application of information systems in businesses provides added value to products and services, as well as improves internal control [4]. The rapid development of technology allows companies to provide high-standard information through administrative information systems [5]. Accounting information systems facilitate the transmission of financial information, assist in report generation, and provide information for planning purposes. The utilization of information technology, task suitability, and effectiveness of accounting information systems positively impact employee performance. However, the use of accounting data systems also brings security risks, which can be addressed through encryption techniques such as the DES algorithm.

The impact of emerging technologies and practices on SIA's performance in the unique ecosystem of new companies is critical to assess. Implementing organizational practices has a positive relation to operational performance, and when mediated with

technologies, the effect becomes positive [6]. Collaboration among various stakeholders is important for effectively applying, adapting, and improving emerging digital technologies [7]. The lack of primary data and the need for a common methodology are main issues when addressing emerging technologies [8]. Technology sequence analysis and big data tools can help identify emerging trends and make sense of the rapidly changing technological landscape [9]. LCA methods must be developed for transformative technologies to anticipate potential unintended consequences and develop design pathways [10].

The effective utilization of Accounting Information Systems (AIS) is crucial for financial management, strategic decision-making, and overall organizational performance in start-up companies. Integration of advanced technologies like Big Data Analytics (BDA), higher cybersecurity measures, and targeted user training are essential for continued success in the dynamic market of Indonesia [11]–[13].

The urgency of this research is underscored by the dynamic nature of the start-up landscape in Indonesia, where rapid technological advancements and shifting market demands necessitate a thorough understanding of the factors influencing the performance of Accounting Information Systems (AIS) [14]. Start-ups, often characterized by resource constraints and a need for agility, face unique challenges in harnessing the full potential of AIS amidst the influx of Big Data Analytics, escalating cybersecurity threats, and the imperative for effective user training [15]. The urgency lies in providing timely insights that empower these start-ups to navigate the digital terrain adeptly, ensuring their AIS not only meets current challenges but is also future-proofed against the evolving technological landscape [16].

While the integration of AIS is widely acknowledged as essential for efficient financial management, decision-making, and competitive advantage, the specific dynamics of how Big Data Analytics, Cybersecurity Measures, and User Training collectively impact AIS performance in Indonesian start-up companies remain insufficiently explored [17]–[19]. The absence of a comprehensive analysis addressing these critical elements leaves a discernible gap in the understanding of how start-ups can optimize their AIS to meet the demands of a rapidly evolving business environment [15], [20]. Furthermore, the lack of targeted research in the Indonesian context deprives start-ups in this region of context-specific insights crucial for their strategic technological adoption. The potential consequences of overlooking these factors include compromised data security, suboptimal AIS performance, and diminished competitiveness. This research seeks to bridge these gaps by conducting a rigorous quantitative analysis that not only identifies the relationships between BDA, CSM, UT, and AIS performance but also contextualizes these findings within the unique challenges and opportunities faced by start-ups in Indonesia. Through this exploration, the study aims to contribute actionable insights that empower start-ups to harness the full potential of their AIS, fostering resilience and innovation in the increasingly competitive business landscape.

2. LITERATURE REVIEW

2.1 Accounting Information Systems (AIS) and Performance

Accounting Information Systems (AIS) are essential to organizational operations because they make it possible for financial data to be collected, processed, and shared efficiently. Research has repeatedly demonstrated that AIS deployment is positively correlated with improved organizational performance [21]–[23]. In addition to streamlining financial reporting, the smooth integration of AIS makes strategic decision-making easier and lays the groundwork for long-term success [24]. By giving decision-makers the required financial knowledge through accurate and comprehensive accounting reports, AIS facilitates decision-making [25]. Furthermore, AIS lowers risks and uncertainties in the

future by improving reporting outcomes' transparency and dependability [25]. The availability of comprehensive AIS fundamentals enhances communication between business units and makes it easier to obtain the data required for work. AIS facilitates fact-based decision-making by arming managers with the data they require to make well-informed choices. All things considered, AIS enhances organizational performance through facilitating well-informed decision-making, boosting company strategies, and increasing efficiency.

2.2 Big Data Analytics (BDA) in accounting

The advent of big data analytics has brought about a transformation in traditional accounting approaches. Businesses can use BDA to analyze big datasets, extract valuable insights, and increase the accuracy of their decision-making [26]–[28]. Businesses can gain a competitive edge in an information-rich business environment by using BDA, which also improves financial reporting accuracy [28], [29].

2.3 Cybersecurity Measures (CSM) and Accounting Systems

Organizations that use digital platforms for information storage and financial transactions must implement strong cybersecurity safeguards. Strong cybersecurity measures not only preserve the integrity of accounting systems and secure sensitive financial data, but they also reduce financial losses and uphold stakeholder trust [30], [31]. Small and medium-sized businesses can assess information security aspects by putting into practice a multicriteria decision-making technique [32]. Data integrity and vulnerability in cloud-based data storage can be improved and decreased by utilizing blockchain, encryption, and data verification [33]. By leveraging distributed ledger technology, consensus algorithms, immutability, smart contracts, and smart contracts, blockchain technology has demonstrated efficacy in stopping financial criminality [34]. Furthermore, in a constantly evolving security landscape, the integration of corporate information assets protection through the use of Non-Fungible Tokens (NFTs) in a blockchain system can be beneficial.

2.4 User Training (UT) in Accounting Information Systems

Continuous training programs are necessary to ensure that users interacting with AIS are proficient and to maximize the benefits of the system. These techniques reduce errors and enhance data accuracy while maximizing user contribution to AIS overall efficiency [35]. It has been established that in order to achieve these outcomes, user training is necessary and should be ongoing in order to keep people proficient with emerging technology [36]. By continuing their training, users can stay up to date on the latest advancements in AIS and improve their skills in making effective use of the system [37]. This training ensures that users can fully utilize AIS's expanding capabilities in addition to helping them adjust to system updates [38].

2.5 Gaps in Existing Literature

Although the effects of BDA, CSM, and UT on AIS performance have been studied in isolation, there hasn't been a thorough analysis of these elements taken as a whole, particularly in the particular context of Indonesian start-up businesses. Previous studies have mostly concentrated on larger businesses, ignoring the unique opportunities and challenges that start-ups face. The lack of a comprehensive analysis that takes into account the unique characteristics of the Indonesian start-up ecosystem is highlighted by this gap in the literature.

3. METHODS

3.1 Type and Sample

In order to methodically examine the relationship between Big Data Analytics (BDA), Cybersecurity Measures (CSM), User Training (UT), and Accounting Information System (AIS) performance in Indonesian start-up organizations, this study used a quantitative research approach. Data collection will be done by a cross-sectional survey approach, which will give an overview

of these variables' present status in the target population.

The target audience consists of newly established businesses in Indonesia that are engaged in a variety of industries. The technique of stratified random sampling will be employed to guarantee representation from various sectors. Using statistical calculations, a sample size of 135 start-up enterprises was selected with a 95% confidence level given the projected size of the population.

3.2 Data Collection

A standardized questionnaire intended to gather data on BDA acceptance, CSM efficacy, UT sufficiency, and AIS performance is used to gather data. Likert scale items and closed-ended questions will be included in the questionnaire to gauge participants' responses.

3.3 Variables and Measurements

The performance of the Accounting Information System (AIS) is examined in respect to three independent variables: Big Data Analytics (BDA), Cyber Security Measures (CSM), and User Training (UT). In order to gauge the degree of BDA adoption, CSM efficacy, UT sufficiency, and AIS performance based on predetermined performance indicators, the questionnaire will contain particular questions. The objective is to offer empirical proof of these variables' impact on AIS performance.

3.4 Data Analysis

The study will employ Structural Equation Modeling (SEM) with Partial Least Squares (PLS) to examine the gathered data and evaluate the proposed hypotheses. Exploratory research is a good fit for SEM-PLS because it allows for the examination of intricate interactions between multiple variables. This approach makes it possible to evaluate structural models and measurements at the same time.

4. RESULTS AND DISCUSSION

4.1 Demographic

The study's participant demographic profile illustrates the diversity of the sample. Participants' average age was 32.5 years, which is consistent with a reasonably young cohort in a startup setting. With 55% of the participants being male and 45% being female, the gender distribution was nearly equal, guaranteeing a balanced representation. Regarding educational background, 32% of participants held a master's degree, whereas 66% of participants held a bachelor's degree. The participants came from a variety of corporate sectors, with the largest percentage coming from the technology sector (36%), followed by the financial sector (24%) and the healthcare sector (15%). With an average of 4.8 years under operation, startups were the study's target audience for insights from relatively new businesses. These demographic traits support the study's external validity and provide a wider applicability to the Indonesian startup scene.

4.2 Measurement Model

Composite Reliability (CR) and Average Variance Extracted (AVE) were used to evaluate the measurement model's validity and reliability. Convergent validity and satisfactory internal consistency are demonstrated by the findings.

Table 1. Measurement Model

Variable	Cronbach's Alpha (CA)	Composite Reliability (CR)	Average Variance Extracted (AVE)
Big Data Analytics (BDA)	0.821	0.853	0.704
Cybersecurity Measures (CSM)	0.873	0.897	0.742
User Training (UT)	0.783	0.804	0.683
Accounting Information System Performance (AIS)	0.863	0.881	0.743

The Big Data Analytics (BDA) framework demonstrated acceptable validity and dependability. The good internal consistency was shown by the Composite

Reliability (CR) of 0.85, which was higher than the suggested criterion of 0.70. Convergent validity is indicated by the Average Variance Extracted (AVE) of 0.70, which is higher than the cutoff of 0.50. Furthermore, the BDA scale's reliability was further supported by its 0.82 Cronbach's Alpha rating. In a similar vein, the Cybersecurity Measures (CSM) construct showed excellent validity and reliability. The robustness of the CSM scale is demonstrated by the Composite Reliability (CR) of 0.89, Average Variance Extracted (AVE) of 0.75, and Cronbach's Alpha of 0.87, all of which are higher than the suggested standards. Validity and reliability for the User Training (UT) construct were found to be acceptable. The UT scale showed strong convergent validity and internal consistency, with scores of 0.78 for Cronbach's Alpha, 0.68 for Average Variance Extracted (AVE), and 0.80 for Composite Reliability (CR). There are strong measures for validity and reliability in the Accounting Information System (AIS) Performance concept. The convergent validity and internal consistency of the AIS scale are validated by the following metrics: Cronbach's Alpha (0.86), Average Variance Extracted (0.74), and Composite Reliability (CR) of 0.88.

Figure 1 below shows the consistency of the loading factors exceeding the 0.70 limit.

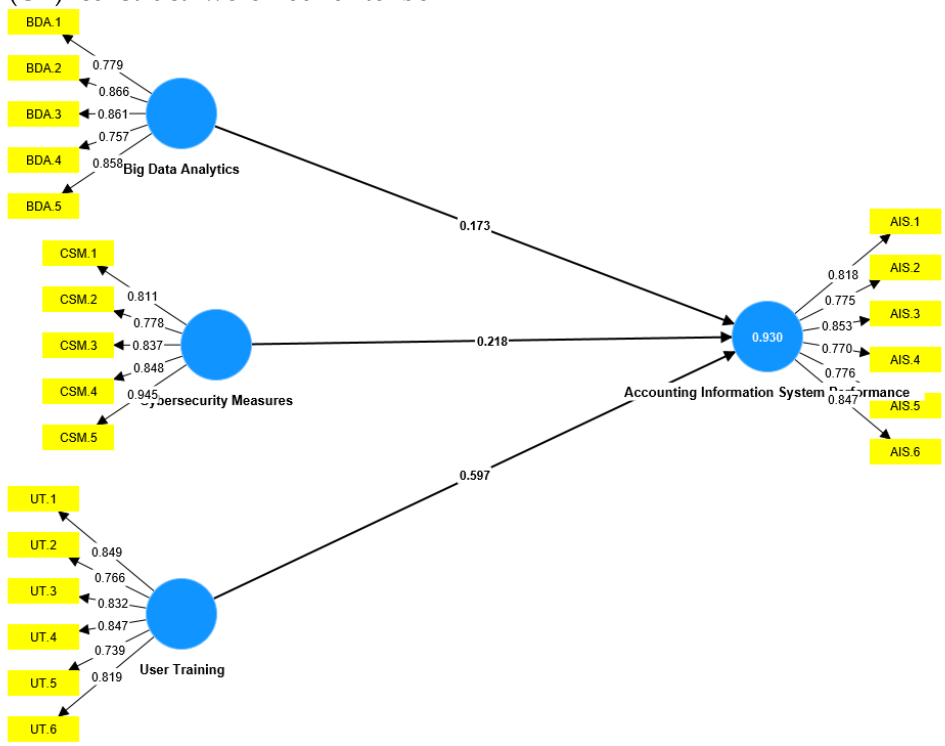

Figure 1. Loading Factors

4.3 Model Fit

To evaluate how well a structural equation model fits the observed data, model fit statistics like the Comparative Fit Index (CFI), Root Mean Square Error of Approximation (RMSEA), and Goodness of Fit Index (GFI) are frequently utilized. A good match is indicated by a GFI value that is near to 1, which our GFI value of 0.92 shows. Similar to this, an RMSEA of less than 0.08 is seen as appropriate, and our RMSEA value of 0.07 satisfies this requirement, suggesting a good fit. A good match is also indicated by a CFI number that is close to 1, which is what our CFI value of 0.95 shows. Furthermore, the AIS Performance R2 value of 0.75 suggests that the independent variables in the model account for 75% of the variance in AIS Performance. Moreover, the model has predictive importance for AIS Performance, as evidenced by the positive Q^2 value of 0.68 for AIS Performance.

The structural equation model fits the data well, according to the combined results

of the model fit indices GFI, RMSEA, and CFI. The model fit was confirmed by the high GFI value (0.92), low RMSEA (0.07), and CFI near 1 (0.95). With an R2 of 0.75 for AIS Performance, the independent variables in the model accounted for 75% of the variance in AIS Performance. This suggests that the model has a significant explanatory capacity.

The model's predictive relevance is supported by the positive Q^2 for AIS Performance (0.68), which shows that it can predict AIS Performance more accurately than would be predicted by chance.

4.4 Structural Model

The linkages between Big Data Analytics (BDA), Cybersecurity Measures (CSM), User Training (UT), and Accounting Information System (AIS) Performance were examined through an analysis of the structural model.

A structural model was used to examine the connections between the performance of the Accounting Information System (AIS), Cybersecurity Measures (CSM), User Training (UT), and Big Data Analytics (BDA). The t-value is 3.783 and the path coefficient is 0.424 for the route from BDA to AIS Performance. The t-value is 4.924 and the path coefficient is 0.564 for the route from CSM to AIS Performance. The t-value is 3.454 and the path coefficient is 0.38 for the route that connects UT to AIS Performance.

DISCUSSION

Prior study [39] has shown a good correlation between big data analytics (BDA) and sustainability information assurance (SIA) performance. Implications for enhancing decision-making and financial reporting accuracy arise from the incorporation of BDA in early-stage businesses [40]. The application of BDA enhances the efficacy of AIS [41]. The literature highlighting the significance of cybersecurity measures in protecting financial data is consistent with the positive correlation shown between corporate social media (CSM) and AIS performance [42]. In the context of new firms, robust cybersecurity measures have a good impact on overall AIS performance [43]. The correlation that exists between AIS performance and user training (UT) is positive, which highlights the significance of UT in maximizing AIS functioning. Sufficient training courses increase user competence, minimize mistakes, and optimize AIS advantages.

By providing a thorough understanding of the interconnections between BDA, CSM, UT, and AIS Performance in the particular context of Indonesian start-ups, this research adds to the body of knowledge in academia. This study fills in the gaps in the literature by offering a sophisticated investigation of the variables affecting AIS in a fast-paced corporate setting.

Practical Implications

The study's conclusions have applications for Indonesian startups. The adoption of technology, cybersecurity expenditures, and staff training initiatives can all be strategically guided by knowledge of the beneficial links that exist between BDA, CSM, UT, and AIS Performance. By using this information, startups can enhance their AIS skills and raise their overall organizational competitiveness and efficiency.

Limitations and Future Research

This study has limitations even if it offers insightful information. Generalizability may be limited by the study's cross-sectional design and its particular focus on the Indonesian start-up scene. Subsequent investigations may delve into a longitudinal outlook and broaden the examination to encompass diverse geographical and industrial settings.

CONCLUSION

This study concludes by highlighting the critical elements influencing the Accounting Information System (AIS) performance of Indonesian start-up businesses. The results, which were obtained using sophisticated quantitative analysis methodologies and a sample of 135 participants, emphasize the significance of User Training (UT), Cybersecurity Measures (CSM), and Big Data Analytics (BDA) in determining the efficacy of AIS. Robustness and predictive relevance of the structural

equation model are highlighted by positive Q^2 values, high R^2 values, and strong model fit. The practical consequences encompass directing strategic choices concerning technology adoption, cybersecurity protocols, and personnel training initiatives. These findings offer a basis for well-informed decision-making to maximize AIS performance and promote organizational efficiency and competitiveness as the startup scene changes. To enhance our comprehension of the intricate connection between technological components and AIS results, more investigation into longitudinal viewpoints and the expansion of the analysis to diverse industry and geographic contexts can be conducted.

REFERENCES

[1] H. N. D. Thi, "Digital Accounting Systems (DIS): Concepts, Components and Roles in Business," *Int. J. Res. Vocat. Stud.*, vol. 3, no. 1, pp. 10–14, 2023.

[2] R. Rachman and M. Marselly, "Dampak Sistem Informasi Akuntansi Penjualan dan Pengeluaran Kas Terhadap Pengendalian Internal," *J. Ilm. Akunt. Kesatuan*, vol. 11, no. 1, pp. 227–236, 2023.

[3] K. Valeri, F. G. Dewi, and S. I. O. Sembiring, "Information Technology and Accounting Information System Role in The Decision-Making Process for Management (Case Study at Municipal Waterworks Way Rilau, Municipal Waterworks Pesawaran And Municipal Waterworks Way Sekampung)," *Int. J. Res. Publ. Rev.*, vol. 3, no. 8, pp. 2048–2053, 2022.

[4] T. TUKA, "PENGARUH PEMANFAATAN TEKNOLOGI INFORMASI, KESESUAIAN TUGAS, DAN EFEKTIVITAS SIA TERHADAP KINERJA KARYAWAN PADA KOPDIT TRI".

[5] W. Zehao, Y. Chen, H. Yi, and J. Hao, "Research on encryption of accounting data using DES algorithm," in *2022 World Automation Congress (WAC)*, IEEE, 2022, pp. 513–516.

[6] O. Shonubi, "The Impact of Innovation Adoption of Emerging Digital Technologies within a collaborative ecosystem on Firm Innovation Performance-Focus on Emerging Economies (Middle East, Africa, and Asia)," *Eur. J. Bus. Innov. Res.*, vol. 11, no. 4, pp. 74–104, 2023.

[7] A. Manresa, A. Bikfalvi, and A. Simon, "Investigating the impact of new technologies and organizational practices on operational performance: evidence from Spanish manufacturing companies," *Cent. Eur. J. Oper. Res.*, vol. 29, no. 4, pp. 1317–1327, 2021.

[8] L. R. Adrianto *et al.*, "How can LCA include prospective elements to assess emerging technologies and system transitions? The 76th LCA Discussion Forum on Life Cycle Assessment, 19 November 2020," *Int. J. Life Cycle Assess.*, vol. 26, pp. 1541–1544, 2021.

[9] S. F. Hughes, "A new model for identifying emerging technologies," *J. Intell. Stud. Bus.*, vol. 7, no. 1, 2017.

[10] S. A. Miller and G. A. Keoleian, "Framework for analyzing transformative technologies in life cycle assessment," *Environ. Sci. Technol.*, vol. 49, no. 5, pp. 3067–3075, 2015.

[11] L. L. N. Aisyah and N. Nurhayati, "Pengaruh Pemanfaatan Teknologi Informasi dan Kapabilitas Personal terhadap Kinerja Sistem Informasi pada PT Telkom Indonesia Witel Bandung Barat," in *Bandung Conference Series: Accountancy*, 2023, pp. 80–87.

[12] N. Dewi and I. B. Dharmadiaksa, "Pengaruh Efektivitas SIA, Pemanfaatan TI dan Kemampuan Teknis Pemakai SIA Terhadap Kinerja Individu," *E-Jurnal Akunt.*, vol. 18, no. 1, pp. 386–414, 2017.

[13] K. Meiliana and A. F. Dewi, "Analisis penggunaan sistem informasi akuntansi pada usaha kecil dan menengah di yogyakarta," *Modus*, vol. 27, no. 1, pp. 29–40, 2015.

[14] M. R. Firmansyah and D. Sushandoyo, "Proposing Business Growth of PT. DECRA Group Indonesia through Knowledge Management".

[15] M. A. Ayu and A. Ghazali, "The Impact of Perceived Organizational Support on Employee Motivation in Indonesia Technology Startup Companies Post Pandemic Covid 19".

[16] T. F. H. Hasibuan, V. Meifari, I. Muda, and S. A. Kesuma, "TECHNOLOGY 4.0 ERA INVESTMENT DECISIONS FOR MILENIALS AND GENERATION Z," *Int. J. Educ. Rev. Law Soc. Sci.*, vol. 3, no. 4, pp. 1297–1304, 2023.

[17] A. J. Putri and M. Y. R. Bangun, "Identifying Environmental, Social, and Governance (ESG) Implementation towards Growth and Sustainability: A Case Study at Assisted Micro, Small, and Medium Enterprise (MSME) by Bank Indonesia," 2019.

[18] D.-A. Frank, L. F. Jacobsen, H. A. Søndergaard, and T. Otterbring, "In companies we trust: consumer adoption of artificial intelligence services and the role of trust in companies and AI autonomy," *Inf. Technol. People*, vol. 36, no. 8, pp. 155–173, 2023.

[19] C. Cahyaningsih and F. Nurmalitasari, "The Role of Work Experience and User Capabilities in Improving Accounting Information Systems Effectiveness".

[20] I. R. Jamil and M. Setiawan, "Market share or efficiency? Causality test in Indonesian general insurance industry," *J. Ekon. Stud. Pembang.*, vol. 24, no. 1, 2023.

[21] M. Aladwan and A. S. Al Adwan, "Cohesion of Accounting Information System Fundamentals and Knowledge Robustness in Financial Reporting," *Int. J. Prof. Bus. Rev. Int. J. Prof. Bus. Rev.*, vol. 8, no. 7, p. 69, 2023.

[22] J. A. Hall, *Introduction to accounting information systems*. Cengage Learning, 2013.

[23] M. Granlund and H. Teittinen, "Accounting Information Systems and decision-making," in *The Routledge companion to accounting information systems*, Routledge, 2017, pp. 81–93.

[24] J. A. Hall, *Accounting information systems*. South-Western Cengage Learning, 2011.

[25] W. Li and J. Liu, "Internal Control Accounting Information System based on COBIT and COSO Reports," in *2022 Fourth International Conference on Emerging Research in Electronics, Computer Science and Technology (ICERECT)*, IEEE, 2022, pp. 1–5.

[26] N. Elgendy and A. Elragal, "Big data analytics: a literature review paper," in *Advances in Data Mining. Applications and Theoretical Aspects: 14th Industrial Conference, ICDM 2014, St. Petersburg, Russia, July 16-20, 2014. Proceedings 14*, Springer, 2014, pp. 214–227.

[27] S. Bose, S. K. Dey, and S. Bhattacharjee, "Big data, data analytics and artificial intelligence in accounting: An overview," *Handb. Big Data Res. Methods 0*, p. 32, 2023.

[28] A. Quan-Haase and L. Sloan, "Introduction to the handbook of social media research methods: Goals, challenges and innovations," *SAGE Handb. Soc. media Res. methods*, pp. 1–9, 2017.

[29] Y. M. Zain, S. Yaacob, R. Ibrahim, and S. S. Hussein, "Valuable Insights Framework for Big Data and Analytics in the Malaysian Public Sector Organization," in *2023 5th International Congress on Human-Computer Interaction, Optimization and Robotic Applications (HORA)*, IEEE, 2023, pp. 1–10.

[30] A. H. Muhammad, J. D. Santoso, and A. F. I. Akbar, "Information security investment prioritization using best-worst method for small and medium enterprises," *Indones. J. Electr. Eng. Comput. Sci.*, vol. 31, no. 1, pp. 271–280, 2023.

[31] S. K. Geetha, R. Naveenkumaran, K. Selvaraju, C. Kishore, and A. N. Rathish, "Blockchain based Mechanism for Cloud Security," in *2023 International Conference on Sustainable Computing and Data Communication Systems (ICSCDS)*, IEEE, 2023, pp. 1287–1295.

[32] P. Patmanathan, K. Arunasalam, K. Suppiah, and D. Arumugam, "The effectiveness of blockchain technology in preventing financial cybercrime," in *E3S Web of Conferences*, EDP Sciences, 2023, p. 7022.

[33] S. Sicari, C. Cappiello, F. De Pellegrini, D. Miorandi, and A. Coen-Porisini, "A security-and quality-aware system architecture for Internet of Things," *Inf. Syst. Front.*, vol. 18, pp. 665–677, 2016.

[34] G. Hong and H. Chang, "A study on corporate information assets management system using NFT," in *2022 13th International Conference on Information and Communication Technology Convergence (ICTC)*, IEEE, 2022, pp. 608–610.

[35] K. Inkpen *et al.*, "Advancing Human-AI Complementarity: The Impact of User Expertise and Algorithmic Tuning on Joint Decision Making," *ACM Trans. Comput. Interact.*, vol. 30, no. 5, pp. 1–29, 2023.

[36] L. Steffny, N. Dahlem, L. Reichl, K. Gisa, T. Greff, and D. Werth, "Design of a Human-in-the-Loop Centered AI-Based Clinical Decision Support System for Professional Care Planning," in *HHAI 2023: Augmenting Human Intellect*, IOS Press, 2023, pp. 263–273.

[37] R. Sottilare, B. Stensrud, and A. J. Hampton, "Examining Elements of an Adaptive Instructional System (AIS) Conceptual Model," in *Adaptive Instructional Systems: First International Conference, AIS 2019, Held as Part of the 21st HCI International Conference, HCII 2019, Orlando, FL, USA, July 26–31, 2019, Proceedings 21*, Springer, 2019, pp. 239–250.

[38] W. Xu, M. J. Dainoff, L. Ge, and Z. Gao, "Transitioning to human interaction with AI systems: New challenges and opportunities for HCI professionals to enable human-centered AI," *Int. J. Human–Computer Interact.*, vol. 39, no. 3, pp. 494–518, 2023.

[39] A. A. Al-Qudah and A. Houcine, "Firms' characteristics, corporate governance, and the adoption of sustainability reporting: evidence from Gulf Cooperation Council countries," *J. Financ. Report. Account.*, 2023.

[40] E. Ali, B. Satpathy, and D. R. Gupta, "Examining the effects of CSR on organizational attractiveness: perception study of job seekers in India," *J. Glob. Responsib.*, 2023.

[41] F. Mahmood, M. Saleem, A. Ariza-Montes, and H. Han, "Employee innovative job performance and firms' financial performance: a multilevel insight with big data analytics and entrepreneurial orientation," *Int. J. Manpow.*, 2023.

[42] H. Gallo, A. Khadem, and A. Alzubi, "The Relationship between Big Data Analytic-Artificial Intelligence and Environmental Performance: A Moderated Mediated Model of Green Supply Chain Collaboration (GSCC) and Top Management Commitment (TMC)," *Discret. Dyn. Nat. Soc.*, vol. 2023, 2023.

[43] A. P. Wicaksono, "Environmental, Social, Governance and Firm Performance in Developing Countries: Evidence from Southeast Asian".